B & Z LIBRARY

Synopsis of Nearctic Ichneumoninae Stenopneusticae with Particular Reference to the Northeastern Region (Hymenoptera)

Part IV

Synopsis of the Ichneumonini: Genera *Chasmias, Neamblymorpha, Anisopygus, Limerodops, Eupalamus, Tricholabus, Pseudamblyteles, Eutanyacra, Ctenichneumon, Exephanes, Ectopimorpha, Pseudoamblyteles*

by

GERD H. HEINRICH
Dryden, Maine

Research Associate, Entomology Research Institute, Research Branch, Canada Department of Agriculture, Ottawa

OHIO STATE UNIVERSITY
JAN 3 -
LIBRARY

THE CANADIAN ENTOMOLOGIST
Supplement 23
1961

Synopsis of Nearctic Ichneumoninae Stenopneusticae with Particular Reference to the Northeastern Region (Hymenoptera)

Part IV

Synopsis of the Ichneumonini: Genera *Chasmias, Neamblymorpha, Anisopygus, Limerodops, Eupalamus, Tricholabus, Pseudamblyteles, Eutanyacra, Ctenichneumon, Exephanes, Ectopimorpha, Pseudoamblyteles*

by

GERD H. HEINRICH
Dryden, Maine

Research Associate, Entomology Research Institute, Research Branch, Canada Department of Agriculture, Ottawa

THE CANADIAN ENTOMOLOGIST
Supplement 23

CONTENTS

PAGE

II. Tribe Ichneumonini (continued)
Genus

12. *Chasmias* Ashmead 373

13. *Neamblymorpha* Heinrich 375

14. *Anisopygus* Kriechbaumer 376

15. *Limerodops* Heinrich 380

16. *Eupalamus* Wesmael 385

17. *Tricholabus* Thomson 387

18. *Pseudamblyteles* Ashmead 397

19. *Eutanyacra* Cameron 422

20. *Ctenichneumon* Thomson 450

21. *Exephanes* Wesmael 475

22. *Ectopimorpha* Viereck 482

23. *Pseudoamblyteles* Heinrich 495

Illustrations 497

Index 505

Synopsis of Nearctic Ichneumoninae Stenopneusticae with Particular Reference to the Northeastern Region (Hymenoptera)

Part IV[1]

Synopsis of the Ichneumonini: Genera *Chasmias, Neamblymorpha, Anisopygus, Limerodops, Eupalamus, Tricholabus, Pseudamblyteles, Eutanyacra, Ctenichneumon, Exephanes, Ectopimorpha, Pseudoamblyteles*

By GERD H. HEINRICH

Dryden, Maine

Research Associate, Entomology Research Institute, Research Branch, Canada Department of Agriculture, Ottawa

12. Genus *Chasmias* Ashmead

Chasmodes Wesmael, 1844, Acad. Sci. Bruxelles Nouv. Mém., 18:13, 15 (preocc.).
Chasmias Ashmead, 1900, U. S. Nat. Mus. Proc., 23:17 (new name).

Type-species—Ichneumon motatorius Fabricius.

The genus is very closely related to *Ichneumon* Linnaeus. Males can scarcely be distinguished from *Ichneumon* males, while females differ by the narrower, more elongate abdomen and stronger head with short, filiform flagellum. All these are evidently adaptive characters connected with the host specialization (see below). The single substantial feature available for clear separation of the two genera seems to be represented by the structure of clypeus, which is apically cut straight in *Ichneumon*, but more or less strongly emarginate in the females of *Chasmias*. Males of *Chasmias* do not share this character. Instead their clypeus is usually more coarsely punctured than in *Ichneumon* males, and these punctures show a tendency to run into irregular longitudinal striae toward the apex of clypeus (Fig. 26). In the type-species the median field of postpetiolus is finely though often weakly longitudinally striate. In the single North American species placed here, *scelestus* Cresson, the median field of postpetiolus is smooth.

In the two European species the color of abdomen is red and black or entirely black in both sexes, with one longitudinal white anal mark on the seventh tergite in the females. The American species fits chromatically this scheme well; it is, however, distinguished by strongly infuscated wings.

As pointed out before in the treatment of the genus *Ichneumon*, I have placed the two closely related species *lugens* Gravenhorst from Europe and *saucius* Cresson from North America in the genus *Ichneumon* instead of *Chasmias* because the clypeus of their females does not show the characteristical features of the latter genus. Both these species are parasites of Aegeriidae. *Chasmias* species are parasites of stem-boring Noctuidae. Females hibernate as adults.

[1]Parts I and II of this paper were published as Supplements 15 and 18 accompanying Volume XCII and Part III as Supplement 21 accompanying Volume XCIII of *The Canadian Entomologist*. The pagination of Part IV is continuous with that of Part III. Unless otherwise specified, footnote, figure and table references apply only to the part in which they are found.

Chasmias scelestus (Cresson)

Figs. 26, 27, 65

Ichneumon scelestus Cresson, 1864, Ent. Soc. Phila. Proc., 3:148, ♀.

Types

Holotype.– ♀, Illinois. A.N.S.

Neallotype.– ♂, Maine, Dryden. C.G.H.

Hosts

According to H. Townes 1951: "*Achatodes zeae* (Harr.); *Papaipema impecuniosa* (Grote); *Parapamea buffaloensis* (Grote)." New record: *Papaipema cataphracta* (Grote). C.N.C.

Distribution

According to H. Townes 1951: "Atlantic to Wisconsin and Illinois in Transition Zone".

Female

Black including legs; wings strongly and evenly infuscated; anal mark on seventh tergite and scutellum apically or predominantly white; median field of postpetiolus smooth; scopa distinct; length 13-16 mm.

Flagellum.–Filiform, short, ventrally not distinctly flattened and not widened beyond middle, with 26-27 segments, the first almost three times as long as wide, the ninth square. Black with white annulus on segments 6 or 7 to 11 or sometimes to 12.

Head.–Strong; temple profile scarcely narrowed with rounded outline, cheek profile more distinctly narrowed with nearly straight outline; malar space shorter than width of base of mandible; apical border of clypeus slightly emarginate (to be seen best when head is tilted somewhat backward), usually with some short, longitudinal indentations or striae (Fig. 27); mandibles rather wide and robust. Black.

Thorax.–Mesoscutum somewhat longer than wide, moderately convex, fairly finely and moderately densely punctured, alutaceous between punctures; notauli anteriorly distinct; scutellum somewhat raised above postscutellum, dorsally flat; area superomedia distinctly longer than wide, rectangular or a little narrowed at base, costulae obsolete or subobsolete (Fig. 65). Black; scutellum apically or predominantly white.

Legs.–Rather short, moderately stout; coxae III ventrally densely punctured with distinct scopa. Uniformly black.

Abdomen.–Fairly slender, sharply oxypygous; postpetiolus with well-defined, smooth median field, lateral fields punctate; gastrocoeli small, triangular, a little deepened, with distinct thyridia; second and third tergites not very densely and fairly finely punctured. Black; sixth tergite medially with white apical border, the seventh with longitudinal white anal mark.

Male

Almost uniformly black including legs; wings strongly and uniformly infuscated; flagellum with white annulus; scutellum except base, facial orbits, apex of femora I and II ventrally and tibiae I ventrally white; length 16 mm.

Flagellum.–Black with short-oval tyloides on segments 6-11, the longest scarcely occupying more than the median half of segments; white annulus on segments 10-14.

Head.—Malar space barely half as long as width of base of mandible; apical border of clypeus almost straight with minute median projection; clypeus coarsely punctured, punctures toward apex usually running into irregular, coarse, longitudinal striae (Fig. 26).

Area superomedia on the average shorter than in the female, costulae usually distinct.

Second tergite somewhat striate between gastrocoeli.

Otherwise like female.

13. Genus *Neamblymorpha* Heinrich

Neamblymorpha Heinrich, 1961, Canad. Entom. Suppl., 15:19.

Type-species—Ichneumon milvus Cresson.

The type-species has been placed in the genus *Pseudamblyteles* Ashmead until now, with which it shares the amblypygous apex of the female abdomen. It is, however, strongly different in appearance from all genuine species of *Pseudamblyteles*. Particularly it differs in the shape of abdomen, structure of female flagellum, sculpture of postpetiolus, structure of gastrocoeli, elevation of scutellum and in color pattern; besides the behaviour is rather devious. I think this species is further differentiated from *Pseudamblyteles* than *Pseudamblyteles* is from *Ichneumon* Linnaeus, and that it therefore deserves generic separation.

Flagellum.—Of both sexes long and extremely slender; of female bristleshaped and almost bristle-thin, not at all widened, all segments considerably longer than wide (Fig. 54).

Head.—Normal; temple and cheek profiles rather strongly narrowed; mandibles narrow.

Thorax.—Mesoscutum strongly convex, distinctly longer than wide, densely punctured and almost opaque; notauli subobsolete; scutellum of female rather strongly raised above postscutellum, more or less gradually slanting toward the latter (Fig. 48); scutellum of male still more elevated, often approaching subglobular shape; area superomedia approximately rectangular, somewhat to considerably longer than wide; costulae absent; areae dentiparae long.

Legs.—Femora, tibiae and tarsi extremely slender and long.

Abdomen.—Prolonged, narrow, parallel-sided, with blunt, strongly amblypygous, not-narrowed apex in the female (Figs. 1, 4); in the male hypopygium apically in the middle somewhat projecting and slightly narrowed; postpetiolus narrow, with distinct median field, which is almost smooth in the female, finely or indistinctly longitudinally striate in the male; gastrocoeli forming longitudinal impressions, fully twice as long as wide, with fairly distinct, slightly oblique thyridia at the apex (Fig. 7).

Color.—Head and thorax predominantly black; legs and abdomen orange, the latter with black apex; very little sexual dimorphism.

Biology.—Amazingly enough, the host of this very common species is not known yet. Females and males are found on moist and shady small clearings or edges of woodland, where the ground is densely covered by rank vegetation, especially ferns; they seem always to stay in the low ground vegetation and their movements are distinctly slower and less alert than those of other species of the tribe. Females evidently do not hibernate. They appear together with the males during June and can be found during the whole summer until the end of September.

***Neamblymorpha milva* (Cresson)**

Figs. 1, 4, 7, 48, 54

Ichneumon milvus Cresson, 1867, Amer. Ent. Soc. Trans., 1:305, ♂.
Ichneumon clopini Provancher, 1875, Nat. Canad., 7:250, ♂.
Pseudamblyteles milvus Townes, 1951, Synoptic Catalog, p. 293, ♂.

Types

Holotypes.–Ichneumon milvus Cresson, ♂, Massachusetts. A.N.S. *Ichneumon clopini* Provancher, ♂, Quebec. Provincial Museum, Quebec.

Neallotype.– ♀, Quebec, St. Sauveur. C.G.H.

Distribution

According to H. Townes 1951: "Nova Scotia to North Carolina, west to Ontario Canadian and Transition Zones".

Male

Head and thorax predominantly black, scutellum yellow; abdomen orange, tergites 5-7, sometimes also apex of fourth tergite black; legs uniformly orange, all trochanters and trochantelli, the coxae I and II and coxae III ventrally pale yellow; flagellum orange, toward apex dorsally more or less infuscated; length 16-17 mm.

Yellow are also: Mandibles except teeth, clypeus, face, lower part of cheeks including malar space, frontal orbits up to lower ocellus, scape below, collare, apex of pronotal ridge, tegulae, subalarum, postscutellum, prosternum, usually apical mark on prepectus and a more or less extensive mark on sternauli, rarely mark on lower part of mesopleura.

The following are pale ferruginous or orange: apical carina of mesopleura, often pronotal base partially, sometimes exterior orbits partially, rarely areae posteroexternae.

Female

Head and thorax predominantly black, scutellum ferruginous; abdomen orange, tergites 4-7 black, the fourth laterally orange at base; legs uniformly orange; flagellum orange with infuscated apex; length 15-17 mm.

Flagellum.–Bristleshaped and bristle-thin, very long and extremely attenuated, not at all widened beyond middle, with 50-52 segments, the first about 6 times as long as wide.

The following are pale ferruginous or orange: mandibles except teeth, clypeus, face, apical part of cheeks including malar space, frontal orbits up to lower ocellus, scape below, collare, apex of pronotal ridge, tegulae, scutellum, often postscutellum; facial orbits often yellowish tinted; sometimes a black mark on each side of median field of face.

14. Genus *Anisopygus* Kriechbaumer

Anisopygus Kriechbaumer, 1888, K. K. Naturh. Hofmus. Ann., 3:36.

Type-species–Amblyteles pseudonymus (Wesmael).

In the almost smooth or finely rugose sculpture of postpetiolus, and in the structure of the very shallow gastrocoeli, this genus shows considerable convergencies with *Cratichneumon* Thomson. Females differ, however, strongly enough by the almost amblypygous apex of their slender abdomen, while males can easily be mistaken for *Cratichneumon*. Both sexes are distinguished by a peculiar pattern of areolation of the propodeum.

Flagellum.—Bristleshaped in female, rather short, ventrally distinctly flattened and slightly or not widened beyond middle. In male with a long row of elongate-oval tyloides.

Head.—Temple and cheek profile moderately narrowed with more or less curved outlines; mandibles rather stout; in female median field of face distinctly, clypeus slightly convex.

Thorax.—Mesoscutum almost flat; scutellum a little raised above postscutellum; propodeum short; carination of horizontal part usually weak or incomplete, especially costulae and carinae dentiparae exteriores often obsolete; area superomedia distinctly wider than long, large, with rounded anterior corners, or semi-elliptic; apices of areae dentiparae slightly prominent.

Legs.—Moderately stout.

Abdomen.—In female semi-amblypygous or amblypygous, in the type-species slender, in *americanus*, new species, prolonged, strongly narrowed, almost parallel-sided; postpetiolus with more or less distinct median field and weak sculpture, usually almost smooth with a few scattered punctures or finely and irregularly rugose; gastrocoeli large, very shallow, scarcely impressed; thyridia distinct, superficial (Fig. 18).

Color

Predominantly black, in the type-species as well as in *americanus*, in the former without, in the latter with some white pattern on the thorax.

Biology

Females do not hibernate. The type of the genus (a European species) is a parasite of the genus *Clostera* Samouelle, and *americanus* of the very closely related (if not synonymous) genus *Ichthyura* Hübner.

1. *Anisopygus pseudonymus* (Wesmael)

Distribution

Holarctic; North America: Alberta, British Columbia and probably (♂) Colorado.

Female

Black, thorax without white pattern; temple orbits sometimes ferruginous marked; flagellum with annulus; abdomen fairly slender but not elongate; length 14-15 mm.

Flagellum.—Bristleshaped, fairly short, apically moderately attenuated and acutely pointed, ventrally distinctly flattened beyond middle and slightly (Europe), or not (North America), widened, with 35-37 segments, the first about twice as long as wide, the tenth or eleventh square. Black, with white annulus on segments 7 or 8 to 12, 13 or 14.

Head.—Temple and cheek profiles moderately narrowed, both with distinctly curved outlines; cheeks somewhat inflated; malar space scarcely half as long as width of base of mandible; median field of face rather strongly, clypeus slightly, convex; mandibles stout. Black; temples sometimes with ferruginous mark.

Thorax.—Mesoscutum scarcely convex, finely and densely punctured, scarcely shiny; notauli basally indicated; scutellum a little raised above postscutellum, dorsally flat, propodeum with fairly weak, usually incomplete carination, the costulae, carinae dentiparae exteriores, lateral carinae of area posteromedia and bordering carinae of areae coxales usually obsolete; apices of areae dentiparae a

very little prominent; area superomedia semi-elliptic, sometimes distinctly wider than long. Uniformly black.

Legs.—Rather stout; coxae III ventrally finely and densely punctured, shiny, without scopa. Black; tibiae I and (in Europe) apex of femora I internally ivory.

Abdomen.—Fairly slender but not elongate, with semi-amblypygous apex; second tergite about 1.25 times as long as apically wide, third and fourth tergites distinctly wider than long; second tergite moderately strongly and fairly densely punctured, scarcely shiny, the third sparsely and less densely but still distinctly punctured; median field of postpetiolus finely and irregularly rugose, with a few scattered punctures, sometimes irregularly striate; gastrocoeli very shallow, scarcely impressed, with rather distinct, superficial thyridia. Black.

Male

Black, flagellum with white annulus; clypeus, face and ventral side of scape white; temple orbits usually ferruginous marked; coxae I white marked; legs I and II externally extensively white; apical border of tergites 2 or 2 and 3 narrowly ferruginous; length 12-15 mm.

Legs.—Black; the following are usually white (ivory): mark on coxae I, tibiae I and II and the tarsi I externally; femora I and apex of femora II externally ivory or pale ferruginous.

1a. *Anisopygus pseudonymus pseudonymus* (Wesmael)

Ichneumon pseudonymus Wesmael, 1844, Nouv. Mém. Acad. Sc. Bruxelles 18:76. ♀, ♂.
Anisopygus pseudonymus Kriechbaumer, 1888, K. K. Naturh. Hofmus. Ann., 3:36.
Amblyteles pseudonymus Berthoumieu, 1895, Ann. Soc. Entom. France, 64:617. ♀, ♂.

Types

Holotype.—♀, ?Musée royal d'histoire naturelle de Belgique, Brussels.

Hosts

According to Berthoumieu 1895: "*Clostera anachoreta* (Taschenberg), *Pygaera curtula* (Brischke), *Pygera* (!) *reclusa* (Kriechbaumer)"; which are: *Clostera anachoreta* (Schiff.), *Clostera curtula* (L.), *Clostera pigra* (Hufn.).

Distribution

Europe.

Female

Head usually uniformly black; flagellum of female slightly widened beyond middle, seen from the flattened side the widest segment about 1.3 times as wide as long; length 12-15 mm.

1b. *Anisopygus pseudonymus nearcticus*, new subspecies

Types

Holotype.—♀, British Columbia, Cluculz Cr. (about 30 m. W. of Prince George). C.N.C. No. 7248.

Allotype.—♂, Colorado, Phantom Valley, 10.VIII.1948, H. M. D. & J. Townes. C.H.T.

Paratype.—1 ♀, Alberta, Nordegg, 27.VII.1936, E. H. Strickland. C.H.T.

Host

The holotype was bred from a pupa of Notodontidae, probably *Ichthyura* Hbn. or *Nadata* Wlk.

Distribution

British Columbia, Alberta, Colorado.

Female

Differs but slightly from *pseudonymus pseudonymus*, the flagellum of female being a little more slender, seen from the flattened side no segment being wider than long; in the two known specimens temple orbits ferruginous marked; length 13-14 mm.

Male

The single known male fits the diagnosis of the European form. Subspecific differences may exist but cannot be stated before a series of specimens has been found and examined.

2. *Anisopygus americanus*, new species

Figs. 13, 15, 18, 63

Types

Holotype.– ♀, Maine, New Portland, 21.VIII.1958, Bernd Heinrich. C.G.H.

Allotype.– ♂, Newfoundland, St. Georges, ex *Ichthyura.* C.N.C.

Paratypes.–1 ♀, Ontario, Blind River; 1 ♀, British Columbia, Pavilion Lake; 2 ♂♂, Nova Scotia, White Pt. Beach; 1 ♀, Newfoundland, St. Georges, ex *Ichthyura apicalis* Wlk. C.N.C.; 1 ♀, Maine, Dryden; 1 ♀, British Columbia, Robson. C.G.H.

Host

Ichthyura apicalis Wlk. in Newfoundland and Ontario (C.N.C.).

Distribution

Maine (holotype); Newfoundland (allotype); Massachusetts (M.C.Z.); Ontario, Wisconsin, British Columbia, Nova Scotia (C.N.C.).

Female

Black; pronotal ridge, subalarum, sides of scutellum, sometimes also a cross-band near apex of scutellum white; abdomen elongate, narrow; length 15-18 mm.

Flagellum.–Bristleshaped, fairly short, ventrally distinctly flattened and somewhat widened beyond middle, apically moderately attenuated, with 36-37 segments, the first about twice as long as wide, the tenth square, the widest 1.3-1.5 times as wide as long. Black with white annulus on segments 7 or 8 to 13 or 14.

Head.–Temple and cheek profiles little narrowed, both with rather strongly curved outlines; cheeks somewhat inflated; malar space scarcely half as long as width of base of mandible; median field of face rather strongly, clypeus slightly, convex; mandibles stout. Black; temples sometimes with white mark.

Thorax.–Mesoscutum scarcely convex, finely and densely punctured, somewhat shiny; notauli distinct and rather long; scutellum a little raised above postscutellum, dorsally flat; propodeum short, with fairly weak, often incomplete carination, the costulae and carinae dentiparae exteriores usually obsolete; area superomedia large, considerably wider than long, with rounded anterior corners (Fig. 63). Black; pronotal ridge, subalarum, lateral stripes on scutellum and sometimes also an apical band on scutellum white.

Legs.–Rather stout; coxae III ventrally finely and densely punctured, shiny, without trace of scopa. Black; femora I at apex, tibiae I and often metatarsus I interiorly white.

Abdomen.—Elongate, narrow, almost parallel-sided, with amblypygous apex; second tergite about 1.5 times as long as wide, the third square, or somewhat longer than wide, both finely and not very densely punctured, shiny; median field of postpetiolus recognizable, but not sharply defined, smooth and shiny with few scattered punctures; gastrocoeli very shallow, barely impressed, with distinct, superficial thyridia (Fig. 18). Black.

Male

Black, scutellum white; flagellum without annulus; tibiae III dorsally with small white mark at the very base; tibiae I and II externally entirely white; length 18 mm.

Flagellum.—With elongate-oval tyloides on segments 4-22, the longest reaching almost from bases to apices of segments. Black, scape ventrally white.

Head.—Face evenly and rather strongly punctate, the median field not strongly prominent as in some similar *Cratichneumon* species; clypeus slightly convex. Black; the following are white: mandibles except teeth, clypeus, face, lower part of frontal orbits, stripe on temple orbits, lower half of cheeks (except apex at base of mandible and posterior third).

Thorax.—Propodeum short, areolation and carination as in female, costulae obsolete. Black; the following are white: pronotal ridge, subalarum, scutellum and postscutellum, sometimes prosternum, prepectus partially and small mark on lower part of mesopleura.

Legs.—Black; the following are white: coxae I and II predominantly, mark ventrally at apex of coxae III, trochanters and trochantelli I and II ventrally, femora I and II and their tibiae and tarsi ventrally, small mark dorsally at base of tibiae III.

Abdomen.—Median field of postpetiolus rather distinct, finely and irregularly longitudinally rugose. Black.

Remark

The species is closely related to the European type-species, differing in the female by the elongate, narrow abdomen, white pattern on thorax and somewhat inflated cheeks.

15. Genus *Limerodops* Heinrich

Limerodops Heinrich, 1949, Mitt. Muench. Ent. Ges., '35-39:44/445.

Type-species.—*Amblyteles subsericans* var. *elongatus* Brischke.

Evolutionally the genus represents a specialized side-branch of *Pseudamblyteles* Ashmead, distinguished in the females by a strongly elongate and narrowed abdomen (Fig. 3). Males too are characterized by their elongate, narrow, parallel-sided abdomen, and besides are differentiated from *Pseudamblyteles* by the shape of claspers (Fig. 28) and by the long row of elongate tyloides which begin on the second flagellar segment. In both sexes the gastrocoeli are longer than wide (Fig. 9), superficial, with several longitudinal carinae.

Related also to *Neamblymorpha* Heinrich, but differing in the structure of gastrocoeli, in the less elevated scutellum, the apically considerably more tapering abdomen of the female and by much stouter legs and flagellar segments.

Flagellum.—Of female bristleshaped, rather thin, moderately long, apically considerably attenuated, not, or scarcely, widened beyond middle (Fig. 53). Flagellum of males with elongate, bacilliform tyloides on second to about twentieth segment.

Head.—Temple and cheek profiles rather strongly narrowed, with nearly straight outlines.

Thorax.—Mesoscutum scarcely convex; notauli basally slightly indicated; scutellum in females little raised above postscutellum and dorsally flat, in males rather strongly elevated.

Legs.—Moderately stout.

Abdomen.—Elongate, narrow; in females distinctly tapering toward apex, strongly amblypygous; tergites 4-7 laterally bending far onto the ventral side, thus transforming the apical part of abdomen into a pipe which is gradually narrowed from segment to segment (Figs. 3, 6); in males parallel-sided, tergites 2 and 3 distinctly longer than wide; ventral fold on sternites 1-3; in both sexes gastrocoeli longer than wide, superficial, with several longitudinal ridges; thyridia narrow and small in females, sometimes obsolete in males; median field of postpetiolus distinct, finely longitudinally striate.

Color.—Head and thorax black with restricted white pattern; abdomen usually uniformly black; in one European species abdomen extensively ferruginous, the last tergite of female with longitudinal white anal mark; legs predominantly rufous.

Biology.—Parasites of grass-feeding Noctuidae. According to H. Hinz (*in litt.*), the female of the European *elongatus* Br. attacks the early larval stages of *Hadena gemina* Hbn. (and probably of other species of this genus) during the period in which the small caterpillars still live hidden in their protective webs in the inflorescences of grasses (especially *Dactylis glomerata* L.). Females do not hibernate, in contrast to *Limerodes* Wesmael and *Pseudamblyteles*. There is one generation per year only. It can be supposed that the American species follow the same biological pattern.

Remarks

The male of the European *elongatus* Brischke is surprisingly similar to the male of the European *Pseudamblyteles subsericans* (Gravenhorst); in a parallel to this case the Nearctic *Limerodops* males have a counterpart in *Pseudamblyteles ormenus* Cresson; in both cases the *Limerodops* males can be distinguished from the *Pseudamblyteles* by differences in structure of claspers and of gastrocoeli (Figs. 9, 28).

The specific taxonomy of this genus has turned out to be more complicated than originally expected. My recent research on the subject has revealed the following facts: (1) There are two extremely similar and chromatically almost congruent species in eastern North America, *belangeri* Cresson and *mariannae*, new species. (2) The males of the two species can be easily distinguished by the shape of the hypopygium. (3) The shape of the hypopygium of the male of the European *elongatus* Brischke corresponds with that of *mariannae*, but not with that of *belangeri*. Therefore I have to revoke my subspecific association of *belangeri* with *elongatus* and rather consider *mariannae* as the Nearctic representative of the Palaearctic *elongatus*. The females of the latter two species are, however, differentiated enough to be treated as different species, although their males are practically indistinguishable. (4) One unique female, which I collected in 1949 in the Alps at 4200 ft. (published in 1952), agrees with the American *belangeri* in all characters by which it differs from the European *elongatus*. I therefore suspect that the latter species is also represented in the Palaearctic fauna, perhaps with Boreo-alpine distribution. This question, however, could not be answered positively until the corresponding male with its different hypopygium is found.

1. *Limerodops belangeri* (Cresson)

Figs. 3, 6, 9, 28, 43, 45, 53

Amblyteles belangeri Cresson, 1877, Amer. Ent. Soc. Trans., 6:190, ♀.
Cryptus dubius Provancher, 1886, Addit. Corr. Faune Ent. Canad. Hym., p. 71, "♂"=♀.
Amblyteles belangeri Townes, 1951, Syn. Cat., p. 294, ♀.
Limerodops fossorius belangeri Heinrich, 1953, Journ. Wash. Acad. Sci., 43:150, ♀.

Types

Holotypes.—*Amblyteles belangeri* Cresson, ♀, Canada. A.N.S. *Cryptus dubius* Provancher, ♀, Ontario. C.N.C.

Neallotype.—♂, New Brunswick, ex *Euxoa divergens* Wlk. C.N.C.

Host

Euxoa divergens Wlk. in New Brunswick (♀ and ♂, C.N.C.).

Distribution

According to H. Townes 1951: "Ontario, New York, Colorado, Alaska". New records: Maine (C.G.H.); British Columbia, Mission City; New Brunswick; Quebec (C.N.C.).

Preamble

Smaller and more slender than *mariannae*, new species; temples of female more strongly narrowed (Fig. 45); sculpture of postpetiolus, second and third tergites finer, apical infuscation on tibiae III more extensive. The latter character also applies to the male, which besides, differs from *mariannae* by the shape of hypopygium (Fig. 43).

Female

Black, in the majority of specimens including the entire scutellum; flagellum without white dorsal annulus, instead ventrally in the middle usually more or less extensively pale yellowish; all trochanters and trochantelli, femora, tibiae and tarsi rufous; tibiae III apically extensively (about ⅕ to ⅓ of their length) black; tarsi III predominantly infuscated; frontal orbits usually narrowly whitish; length 15-16 mm.

Flagellum.—Bristleshaped, thin and slender, moderately long, considerably attenuated and acutely pointed at apex, ventrally flattened but not widened beyond middle, with 41-45 segments (Fig. 53), the first nearly 3 times as long as wide, about the ninth or tenth approximately square. Black, ventrally in the middle usually more or less extensively pale yellowish.

Head.—Temple and cheek profile strongly narrowed with almost straight outlines; malar space about as long as width of base of mandible. Black, frontal orbits often narrowly white.

Thorax.—Scutellum slightly raised above postscutellum, dorsally flat and gradually slanting toward postscutellum; carination of propodeum complete, except costulae, which are obsolete or subobsolete; area dentiparae rather strongly sloping; area superomedia usually narrowed toward area basalis and apically about as wide as medially long, sometimes somewhat wider than long. Black, usually including scutellum, the latter sometimes white marked; tegulae brownish.

Legs.—Moderately stout. Rufous, including trochanters and trochantelli; coxae black; apical ⅕ to ⅓ of tibiae III black; tarsi III predominantly infuscated.

Abdomen.—Narrow, elongate, strongly tapering toward apex (Fig. 3); median field of postpetiolus clearly defined, with weak, often subobsolete, longitudinal striation; second tergite fully 1.5 times as long as apically wide, all the

following tergites considerably longer than apically wide; gastrocoeli longer than wide, superficial, with several irregular, longitudinal ridges, and with short, usually fairly distinct thyridia at the apex (Fig. 9); sculpture of second tergite fine, but fairly dense, basally in the middle the punctures running into irregular, fine, longitudinal striae; about basal half of third tergite very finely and rather sparsely punctured, the apical half becoming gradually more shiny and almost smooth; following tergites shiny and almost smooth. Uniformly black.

Male

Black, scutellum apically or entirely yellow; legs rufous, tibiae III apically as extensively black as in the female, tarsi III, however, not infuscated; coxae III and base of anterior coxae black, coxae I and II predominantly, trochanters I and II entirely yellow; length 15-16 mm.

Flagellum.—With elongate, narrow, bacilliform tyloides on segments 2-18, most of them reaching from bases to apices of segments. Black, scape ventrally yellow.

Head.—Black; the following are yellow: mandibles except teeth, clypeus, face, frontal orbits not quite up to level with lower ocellus, sometimes mark on lower part of outer orbits.

Thorax.—Costulae usually distinct. Black; the following are (partially or entirely) yellow: pronotal ridge, subalarum, tegulae, scutellum.

Legs.—See short diagnosis above.

Abdomen.—Narrow and elongate as in the female, the second and third tergites of about the same relative length; as the abdomen is not tapering toward apex as in the female, the apical tergites are of course shorter compared to their width than in the female; sculpture denser and stronger than in the female, but on the second tergite less coarse than in *mariannae;* hypopygium apically not medially produced, its apex forming an even, rather flat curve (Fig. 43).

2. *Limerodops mariannae,* new species

Figs. 44, 47

Types

Holotype.—♀, Maine, Dryden, 15.VIII.1955, Marianne Heinrich. C.G.H.

Allotype.—♂, Maine, Dryden, June 1951, Gerd H. Heinrich. C.G.H.

Paratypes.—1 ♀, Nova Scotia, Starr's Point (on Minas Basin near Wolfville); 1 ♀, Ontario, Toronto. C.N.C. No. 7247; 1 ♀, Massachusetts, Mt. Greylock; 1 ♀, Ontario 1 ♀, Massachusetts, North Adams. U.S.N.M.

Distribution

Transition Zone in Maine, Ontario, Massachusetts.

Preamble

Abdomen of female less narrowed than in *Limerodops belangeri* (Cresson), but narrower and more elongate than in *Pseudamblyteles ormenus* (Cresson). The species thus can be mistaken for either one of the two. The female differs from *belangeri* in the distinctly less strongly narrowed temple profile, the denser sculpture of the anterior tergites, the wider and less-elongate tergites 2-4, the distinctly more-restricted infuscation on apex of tibiae III and usually in the color of flagellum. It differs from *Pseudamblyteles ormenus* mainly by the slenderer flagellum with considerably more-elongate basal segments, and also by the shape of gastrocoeli. Structure of flagellum, gastrocoeli and abdomen as in *Limerodops elongatus* (Brischke), which makes the generic position doubtless.

The male differs from *belangeri* by the shape of hypopygium which equals that of the hypopygium of *elongatus* (Fig. 44).

Female

Black, including scutellum, the latter rarely white marked; legs rufous including trochanters and trochantelli; coxae black; infuscation on apex of tibiae III restricted, considerably less extensive than in belangeri; tarsi III infuscated except base; flagellum basally often ferruginous or with indicated, rarely with distinct, dorsal annulus; length 16-17 mm.

Flagellum.—Bristleshaped, thin and slender, moderately long, considerably attenuated and acutely pointed at apex, ventrally flattened, but not widened beyond middle, with 45-48 segments, the first nearly three times as long as wide, the twelfth or thirteenth approximately square. Black; basal segments often brownish or ferruginous, sometimes with slightly-indicated brownish, exceptionally with distinct white, dorsal annulus.

Head.—Temple profile but moderately narrowed, considerably less so than in *belangeri*, with scarcely curved outline (Fig. 47), cheek profile rather strongly narrowed, with straight outline; malar space about as long as width of base of mandible. Black; frontal orbits narrowly white, sometimes white dot on each corner of clypeus.

Thorax.—As in *belangeri.* Black; tegulae brownish or ferruginous; rarely scutellum with white mark.

Legs.—Moderately stout. Rufous, including trochanters and trochantelli; coxae black, anterior coxae sometimes white marked; infuscation on apex of tibiae III restricted, much less extensive than in *belangeri;* tarsi III infuscated, except base.

Abdomen.—Elongate, but not quite as narrow as in *belangeri,* second tergite about 1.3 times as long as apically wide, the third square; median and lateral fields of postpetiolus distinctly longitudinally striate; second tergite fairly finely, but densely punctured, longitudinally striate between gastrocoeli, in contrast to *belangeri* nearly opaque; third tergite more finely but also rather densely punctured except at apex, and also less shiny than in *belangeri;* gastrocoeli as in the latter species. Uniformly black.

Male

In my collection are three males from the type locality which I think belong to the female described above. They are extremely similar to the males of *belangeri,* but differ by the shape of hypopygium, larger size and less slender abdomen, the second and third tergites being somewhat less elongate and more coarsely sculptured; besides, they share the restriction of apical infuscation of tarsi III with the female, and their tarsi III are apically more or less infuscated in contrast to the males of *belangeri.*

General appearance and color similar to belangeri; *infuscation on apex of tibiae III more restricted, tarsi III infuscated toward apex; sometimes pale ferruginous-yellowish marks latero-basally on third tergite; sculpture of second and third tergites coarser than in* belangeri; *size larger, abdomen not quite as narrow; median part of hypopygium distinctly projecting in the shape of a short, wide tongue* (*Fig. 44*); *length 17 mm.*

Remarks

Males of *mariannae* are practically not distinguishable from males of the European *elongatus,* whereas females of the former species differ from the latter

in color of flagellum, by the usually black scutellum and more distinctly by the less-slender and less-tapering shape of abdomen. Whether these differences should be considered as specific or subspecific is a matter of opinion.

16. Genus *Eupalamus* Wesmael

Eupalamus Wesmael, 1844, Nouv. Mém. Acad. Sci. Bruxelles, 18:13 (Tentamen).

Type-species.—*Eupalamus oscillator* Wesmael.

Closely related to *Cratichneumon* Thomson, in sculpture as well as in color pattern. The most important distinctive character is presented by the propodeum, which is flattened, the horizontal part being long, sometimes much longer than the declivity, with a more or less prolonged, parallel-sided or gradually narrowed-toward-the-apex area superomedia (Fig. 64). Besides, in typical species, tarsi I and II are more or less considerably dilated. All species known so far are large; some of the Himalayan region range among the very biggest of the subfamily.

Flagellum.—In female stout, lanceolate, ventrally strongly flattened and strongly widened beyond middle, considerably attenuated at apex.

Head.—Cheek and temple profiles never considerably narrowed, the latter broadly rounded; median field of face distinctly defined and convex; mandibles strong, with comparatively short teeth (Fig. 25).

Thorax.—Mesoscutum flat, scarcely longer than wide; anterior third of notauli distinct; scutellum flat; horizontal part of propodeum rather flat, never much shorter, often much longer, than the declivity, with weak, often partially indistinct carination, usually coarsely rugose toward apex; area superomedia often much longer than wide, either parallel-sided or narrowed toward apex (Fig. 64).

Legs.—Stout, femora thick; tarsi I and II of females in the type-species, and in all typical species more or less widened.

Abdomen.—Strongly oxypygous, in general appearance similar to big species of *Coelichneumon* Thomson or *Melanichneumon* Thomson; median field of postpetiolus not very sharply bordered, but distinct, and usually rather smooth with a few, scattered punctures, sometimes rather densely and strongly punctured (Fig. 39); gastrocoeli superficial and fairly small, thyridia small but distinct; anterior tergites moderately densely and moderately strongly punctured, never medially striate.

Color.—All European and American species are predominantly black, most of them with white-banded tibiae. In the Himalayan region large, mainly ferruginous species occur. Little individual variability and sexual dimorphism.

Biology.—Females do not hibernate; my observations in Europe seem to indicate that there is only one generation per year. Nothing is known about the host of the two American species described below. There are very few host records concerning the three European species. Constantineanu (1960) mentions *Aporia crataegi* L. and *Malacosoma crataegi* L. as hosts of the type-species for Rumania.

Distribution.—The genus is Holarctic, including the higher elevations of the Himalayan Zone.

1. *Eupalamus andersoni*, new species

Figs. 25, 39, 52

Types

Holotype.—♀, British Columbia, Stuarts Lake, 18.IX.1921, W. B. Anderson. C.N.C. No. 7182.

Distribution

British Columbia.

Female

Black, including scutellum; wings slightly infuscated; all tibiae with broad, white annulus; temple orbits with small, brownish mark; median field of postpetiolus rather densely punctured; tarsi I and II very little widened; length 19 mm.

Flagellum.—Bristleshaped, ventrally strongly flattened and widened beyond middle, considerably attenuated at apex, with 48 segments, the first about 1.3 times as long as wide, the fifth square, the widest about 2.5 times as wide as long. Black with white annulus on segments 6-19.

Head.—Temple and cheek profiles slightly narrowed, the former with slightly curved outline; malar space about ⅔ as long as width of base of mandible; median field of face separated from the lateral fields as well as from the clypeus by very distinct impressions, rather strongly convex, the lateral fields also convex (Fig. 25). Black; temple orbits with small brownish dots, clypeus with small yellowish lateral mark.

Thorax.—Mesoscutum flat, rather finely and not very densely punctured, with wide, shallow, longitudinal depressions between median and lateral lobes and also on top of the latter; basal third of notauli sharp, like a cut; horizontal part of propodeum distinctly longer than declivity; area superomedia weakly bordered, narrow, fully twice as long as medially wide; areae dentiparae toward apical border coarsely, irregularly reticulate-rugose. Uniformly black.

Legs.—Stout, tarsi I and II but slightly widened (Fig. 52); coxae III ventrally moderately strongly and densely punctured, shiny. Black; all tibiae with broad, white annulus

Abdomen.—Median field of postpetiolus well defined and rather densely punctured (Fig. 39); gastrocoeli small; second and third tergites finely and densely punctured. Uniformly black.

2. *Eupalamus melacneme*, new species

Fig. 64

Types

Holotype.— ♀, Aylmer, Ontario, 3.VIII.1924, A. R. Graham. C.N.C. No. 7183.

Allotype.— ♂, Montreal, Quebec, B. Tache. C.N.C. No. 7183.

Distribution

Ontario, Quebec.

Female

Black, including scutellum and legs; wings slightly infuscated; temple orbits with very small, brownish dot; median field of postpetiolus with few, scattered punctures; tarsi I and II slightly widened; length 17 mm.

Flagellum.—Bristleshaped, ventrally strongly flattened and widened beyond middle, considerably attenuated at apex, with 48 segments, the first about 1.3 as long as wide, the fifth square, the widest about 2.5 times as wide as long. Black, with white annulus on segments 5-20.

Head.—Temple and cheek profiles slightly narrowed, the former with slightly curved outline; malar space about ⅔ as long as width of base of mandible; median field of face separated from the lateral fields and from the clypeus by

distinct impressions, distinctly convex, the lateral fields slightly convex. Black, temple orbits with very small brownish dot.

Thorax.—Mesoscutum flat, a little stronger punctured than in *andersoni*, new species, without shallow, longitudinal depressions between median and lateral lobes; basal third of notauli sharp, like a cut; horizontal part of propodeum distinctly longer than declivity; area superomedia weakly bordered, narrow, fully twice as long as wide (Fig. 64); areae dentiparae coarsely, irregularly reticulate-rugose toward apex. Uniformly black.

Legs.—Stout; tarsi I and II slightly widened, second segment of tarsi II approximately twice as long as apically wide; coxae III ventrally moderately strongly and densely punctured, shiny. Uniformly black including tibiae and tarsi; anterior tibiae and tarsi somewhat brownish tinted.

Abdomen.—Median field of postpetiolus moderately well defined, with a few scattered punctures; gastrocoeli small; second and third tergites densely and rather finely, the fourth less densely and more finely, but still distinctly, punctured. Black.

Male

Black, including scutellum; the following are white: face, clypeus, subalarum, tegulae, all tarsi, tibiae I and II dorsally and basally also ventrally, tibiae III narrowly around the base, with an exterior extension to about middle; flagellum with white annulus; length 23 mm.

Flagellum.—With 47 segments, with short-oval tyloides on segments 7-17, and with white annulus on segments 16-22. Scape ventrally inconspicuously light dotted at apex.

Head.—Malar space very short, about ¼ as long as width of base of mandible. Black; face, clypeus and mandibles, except teeth, white.

Thorax.—Scutellum fairly strongly convex; horizontal part of propodeum not longer than declivity; area superomedia about 1.5 times as long as basally wide, strongly narrowed from insertion of costulae toward apex, costulae fairly distinct. Black; subalarum and tegulae in part white.

Abdomen.—Sculpture of narrow base of second tergite coarsely reticulate-rugose. Black.

Remark

The male above was associated with *melacneme* female rather than with *andersoni* on account of: (1) its restricted white pattern on tibiae III which does not seem to match the broad white tibial annulus of *andersoni*, and (2) the common distribution.

17. Genus *Tricholabus* Thomson

Tricholabus Thomson, 1894, Opusc. Ent., fasc. 19, pp. 2103, 2113.

Type-species.—*Tricholabus femoralis* Thomson. Designated by Viereck, 1914.

Otohimea Uchida, 1926, Coll. Agr. Hokkaido Univ. Journ., 18:146.

Type-species.—*Otohimea nigra* Uchida.

A very distinct, and in both sexes a very clearly defined, genus.

Flagellum.—Of females bristleshaped, with elongate basal segments, slender, not, or scarcely, widened beyond middle, extremely attenuated, with acute apex. Flagellum of males "nodulose", the segments on ventral side with transverse ridges topped with short bristles, the ridges situated close to the apices on the

basal segments, and not far beyond the middle on the median and apical segments; tyloides absent.

Head.—Temples wide, rounded; occiput deeply emarginate; sides of clypeus very slightly prominent and converging toward apex; mandibles rather short and stout, with strong apical teeth separated by a rather wide gap, the upper tooth longer than the lower.

Thorax.—Mesoscutum moderately convex; scutellum distinctly raised above postscutellum and fairly strongly convex; horizontal part of propodeum shorter or longer than declivity; area superomedia narrowed toward base, often longer than wide, approaching the shape of a hexagon or gothic arch (Fig. 51); costulae usually distinct; areae dentiparae slanting considerably backward in a gradually rounded slope.

Legs.—Slender and rather long, femora slim; coxae III never with scopa.

Abdomen.—Of females amblypygous, moderately narrow (Figs. 10, 14) and a little elongate; in both sexes, postpetiolus with some gross punctures laterally and near apex, the median field usually partially smooth; gastrocoeli comparatively large and deep, about as long as wide, their interval usually narrower than one of them (Fig. 16); hypopygium of males with an approximately triangular, rather short, median projection of a very characteristic shape, being neither flat nor apically pointed as in some *Spilichneumon* and *Eutanyacra* species, but convex, its lateral and apical borders bending evenly toward ventral surface of abdomen (Fig. 29).

Color.—Head and thorax usually black, with more or less restricted white pattern; abdomen red or black, or red with black apex, in the majority of species with white apical pattern, often also with white marks or bands on anterior tergites. Moderate individual and regional chromatic variability; sexual dimorphism small in European, considerable in American, species, where the red color of abdominal tergites of females is usually replaced by black in the males; besides, white pattern in males usually more extensive than in females.

Biology.—Females do not hibernate; there seems to be only one generation per year; males and females appear during June, females may be found until August. Hosts unknown.

Distribution.—Temperate Zone of Palaearctis and Nearctis.

Remarks

As clearly defined generically by distinct morphological characters as *Tricholabus* is on the whole, the species themselves, by contrast, are morphologically scarcely distinguishable from each other. Except for occasional slight differences in the structure of the head, all species seem to be built almost congruently. Consequently the specific diagnosis has to be based largely on chromatic characters. These are fairly constant in the females, but individually highly variable in the males. Besides, the American species of the genus show considerable chromatic sexual dimorphism. As a result, the identification of females presents no real difficulties, whereas the concept of specific diagnostic characters in males is not fully satisfactory yet, and in some cases, not beyond doubt.

Key to the Species of *Tricholabus* Thomson of North America

Females

1. Head and thorax black including scutellum, without white pattern; wings usually infuscated. (Western species; abdomen red, femora red or black; length 12-13 mm.) ..... 5. *foxleei*, new species and 6. *pax* Dalla Torre (females of the latter unknown)

Head and thorax black or ferruginous with white pattern; scutellum white; wings not infuscated. 2

2. Head and thorax ferruginous. (Subalarum and mark on metapleura yellowish-white; flagellum with restricted, often without, annulus; area superomedia long and narrow, length 12-13 mm.) ..... 4. *mitchelli*, new species

Basic color of head and thorax black 3

3. Tergites 4 or 5-7 black. (Tergite 6 with white apical band, seventh tergite with white apical mark; femora III black.) 4

Basic color of entire abdomen ferruginous. 5

4. Temple profile slightly narrowed (Fig. 59); tergites 2-4 red (exceptionally the fourth infuscated); tibiae III medially brown. (Abdomen slender; length 11-13 mm.) ..... 1. *nortonii* (Cresson)

Temple profile not narrowed, with strongly curved outline (Fig. 58); only tergites 2-3 red; tibiae III uniformly black. (Abdomen stouter than in the alternative species; length 12-14 mm.) ..... 2. *citatus* (Provancher)

5. Temple profile slightly narrowed (Fig. 59); postpetiolus and anterior tergites without yellow pattern; neither mesoscutum medially nor mesopleura white marked. (Femora III red, apically black; metapleura often white marked; length 11-13 mm.) ..... 1. *nortonii* (Cresson), variety 1

Temple profile not narrowed, with strongly curved outline (Fig. 61); postpetiolus with yellow apical band, tergites 2 and 3 with more or less extensive apico-lateral yellow marks; mesoscutum with two short, apically-converging, white median stripes. (Length 11-14 mm.) ..... 3. *adventicus* Hopper

Males

1. Flagellum without annulus (abdomen usually partially or uniformly ferruginous). 2

Flagellum with white annulus (abdomen always black, with or without white pattern). 4

2. Thorax with rich white pattern, or at least metapleura white marked and scutellum white; wings not infuscated. (Basic color of head and thorax varying from entirely ferruginous to black combined with ferruginous to black; length 12-13 mm.) ..... 4. *mitchelli*, new species

Thorax, including scutellum and metapleura uniformly black; wings rather strongly infuscated. (Western specimens.) 3

3. Tergites beyond first usually uniformly red of uniformly black; temples and cheeks less widened than in the alternative species. (Legs varying from uniformly red to predominantly black; length 11-14 mm.) ..... 5. *foxleei*, new species

Tergites 1-5 red, 6 and 7 black; temples and cheeks wider than in the alternative species. (Length 12 mm.) ..... 6. *pax* Dalla Torre

4. All tergites with regular, white apical bands; mesoscutum with two short, white median stripes; meso- and metapleura white marked; propodeum with incomplete, white W-pattern. (Length 11-15 mm.) ..... 3. *adventicus* Hopper

White pattern less extensive; mesopleura almost never, and mesoscutum very rarely, white marked. 5

5. Head in dorsal view wider, cheeks and temples wider than in the alternative species; notauli obsolete. (White pattern on the average less extensive than in the alternative species, metapleura not white marked, tergites beyond postpetiolus without white apical pattern; length 13-15 mm.) ..... 2. *citatus* (Provancher)

Head in dorsal view narrower, cheeks and temples less widened than in the alternative species; notauli basally distinct. (White pattern very variable and on the average more extensive than in the alternative species; metapleura often white marked, tergites beyond postpetiolus sometimes with white apico-lateral marks, or apical bands; length 11-15 mm.) ..... 1. *nortonii* (Cresson)

1. *Tricholabus nortonii* (Cresson)

Figs. 10, 14, 16, 29, 51, 59, 60

Ichneumon nortonii Cresson, 1867, Amer. Ent. Soc. Trans., 1:304, ♀.
Ichneumon merus Cresson, 1877, Amer. Ent. Soc. Trans., *6*:148, ♀.

Types

Holotypes.–*Ichneumon nortonii* Cresson, ♀, Connecticut. A.N.S. *Ichneumon merus* Cresson, ♂, Virginia. A.N.S.

Distribution

According to H. Townes 1951: "Atlantic to Continental Divide in Canadian and Transition Zones".

Preamble

Females of this species are rather similar to *tricolor* Davis (here regarded as the female and therefore as synonym of *citatus* Provancher), which seems to have a corresponding distribution. The distinction of both females presents, however, no serious difficulty (see *citatus* ♀, preamble). More problematic is the distinction of the males of the two species which evidently both have black basic color of head, thorax and, in contrast to the females, also abdomen. The differences I believe I have found are subtle and not infallible in all cases.

Female

Head, thorax and tergites 5-7 black with some white pattern; postpetiolus or entire first segment and tergites 2-4 red; legs extensively, the hind legs predominantly black, tibiae III medially red-brown, at base narrowly, at apex broadly, blackish; scutellum, often a rounded mark on vertical orbits, apical band on sixth and anal mark on seventh tergite white; length 11-13 mm.

Flagellum.–Bristleshaped, very slender, extremely attenuated with acute apex, ventrally flattened beyond middle but not widened, with 43-47 segments, about the fifteenth approximately square. Black, segments 7 or 8 to 13 with white annulus.

Head.–Temple profile slightly narrowed with curved outline (Fig. 59); cheek profile distinctly narrowed with straight outline; malar space little shorter than width of base of mandible; cheeks and temples finely and sparsely punctured. Black; often rounded white mark on frontal orbits.

Thorax.–Mesoscutum densely and strongly, scutellum sparsely punctured; notauli basally distinct; area superomedia elongate and more or less narrowed toward base, sometimes shaped like a gothic arch; costulae more or less distinct. Black; scutellum, often postscutellum and mark on collare white, more rarely also the very apex of pronotal ridge, exceptionally its whole length.

Legs.–Coxae, trochanters, trochantelli predominantly, the femora III entirely black; femora I and II usually predominantly or at least basally black, brown toward apex and ventrally except base; tarsi II and III strongly infuscated; tibiae III medially more or less extensively and intensively brown, narrowly black at base, more broadly black at apex.

Abdomen.–Red, tergites 5-7 and often the base of petiolus black; tergite 6 with white band on middle of apex, the seventh with white anal mark; fourth tergite rarely partially infuscated.

Remarks

In one specimen from New Jersey (U.S.N.M.), pronotal ridge entirely white, metapleura with large, white mark, coxae III dorsally white marked.

Male

Extremely similar to *citatus* in appearance and color. Differing only by the temple profile which is not quite as widened as in *citatus*, by the notauli, which are not obsolete, but more or less distinct at base, and by the somewhat less densely punctured mesoscutum. Besides, the white pattern on thorax and abdomen are on the average more extensive than in *citatus*. I suppose that all specimens with a white mark on metapleura or with white apico-lateral marks on anterior tergites (beyond the first) may securely be considered as belonging to *nortonii*. In the more melanistic specimens, which do not display the mentioned white pattern, only the width of temple profile and the presence or obsoletion of basal impression of notauli remain for specific distinction.

Black; scutellum white; seventh tergite with white apical mark; often large white mark on metapleura; sometimes postpetiolus, more rarely some or even all the following tergites with white apical bands or apico-lateral marks; flagellum with white annulus; length 11-15 mm.

White pattern extremely variable. The following are white: base of mandibles, face and clypeus except a common median longitudinal black band, frontal orbits broadly usually up to vertex, outer orbits more or less extensively, scape ventrally, collare, pronotal ridge (sometimes apically, sometimes entirely), subalarum, tegulae, scutellum, often postscutellum, often a large mark on metapleura, rarely markings on propodeum, usually apical band or two apico-lateral marks on postpetiolus, often apico-lateral marks on the following tergites too, rarely apical bands on all tergites, anal mark on seventh tergite, sometimes dorsal marks on coxae III, femora I and II apically, tibiae I and II dorsally, broad annulus on flagellum, exceptionally two small, median marks on mesoscutum; sometimes abdomen uniformly black.

Variety 1, Female

Basic color of entire abdomen red, femora III red with black apex; metapleura often with white mark.

Specimens from the more southern parts of the range of distribution of the species *nortonii* show a higher degree of chromatic variability than northern populations. Corresponding to the general rule, the white pattern tends to increase toward the south. This is evident on the pronotal ridge and metapleura (see also above remark at the end of female description). Besides, erythristic mutants, as named above, which have not been found yet in the Canadian zone and northern New England, have been collected in Connecticut, Massachusetts and Maryland (U.S.N.M.) and in New York (C.H.T.). These facts seem to indicate the beginnings of subspecific differentiation, in which one day the erythristic mutant may achieve predominance. At the present time it occurs from Massachusetts southward side by side with specimens with red and black abdomen and with black femora III, and therefore scarcely could be called a subspecies.

2. *Tricholabus citatus (Provancher)*

Fig. 58

Ichneumon citatus Provancher, 1877, Nat. Canad., 9:8, ♂.
Amblyteles tricolor Davis, 1898, Amer. Ent. Soc. Trans., 24:351, partim (♀).
Ichneumon apicator Hopper, 1938, Amer. Ent. Soc. Trans., 64:100, ♂.

Types

Holotypes.–Ichneumon citatus Provancher, ♂, Quebec. Provincial Museum Quebec; *Amblyteles tricolor* Davis, ♀, South Dakota. A.N.S.; *Ichneumon apicator* Hopper, ♂, Maine, Medomak. A.N.S.

Distribution

According to H. Townes 1951 (*tricolor*): "Maine, South Dakota". New records: ♀, Quebec (C.N.C.).

Preamble

Females of this species are chromatically similar to *nortonii* Cresson, but differ distinctly in structure by the wider temples and cheeks, the somewhat wider mesoscutum with subobsolete or obsolete notauli, and by the less slender abdomen. In Maine the species was found side by side with *nortonii*. There seems to be no regional difference between females from Maine and Quebec and the type specimen from South Dakota. The association of sexes is somewhat problematic. Davis described the male as almost identically colored with the female. No male of such a color pattern has ever been found in Maine and Quebec. I therefore doubt the correctness of Davis's association. Instead, I suppose that the male of *tricolor* Davis has a black abdomen, as have the males of *nortonii* and *adventicus* Hopper, and that it is very similar to the former. Examining large numbers of black eastern males I found that certain specimens differ from the bulk of typical *nortonii* by having slightly more strongly widened temples, more densely punctured mesoscutum, absence of notauli and usually more strongly punctured cheeks and temples. These specimens have the metapleura not white marked, as *nortonii* males have so often, but usually show a white mark on the postpetiolus. I suppose that they represent the other sex of *tricolor* Davis. The mentioned characters are presented by the type of *Ichneumon citatus* Provancher which, in case my hypothesis is proven correct, would be the older and thus the valid name for the species.

Female

Head, thorax and tergites 4-7 black, with some white pattern; tergites 1-3 red; legs predominantly, the hind legs uniformly, black, including tibiae; scutellum, usually a rounded mark on frontal orbits, subalarum, apical band on sixth and mark on seventh tergite white; length 12-14 mm.

Flagellum.—Bristleshaped, very slender, extremely attenuated, with acute apex, ventrally flattened but not widened beyond middle, with about 46 segments, about the fifteenth approximately square. Black, with white annulus on segments 7 or 8 to 13.

Head.—Temple profile not narrowed, with strongly curved outline (Fig. 58); cheek profile distinctly narrowed, but less than in *nortonii*, with straight outline; malar space almost as long as the width of base of mandible; cheeks somewhat more strongly punctured than in *nortonii*. Black; usually white mark on frontal orbits.

Thorax.—Mesoscutum a little more densely punctured than in *nortonii*, alutaceous between punctures; notauli obsolete or subobsolete; area superomedia elongate and narrowed toward apex; costulae distinct. Black; scutellum, postscutellum, collare, subalarum and usually apex of pronotal ridge white.

Legs.—Legs III entirely, legs II predominantly black; tibiae II ventrally dark brown, tibiae and tarsi I partially pale brown.

Abdomen.—Not quite as slender as in *nortonii;* second tergite scarcely longer than apically wide, the third nearly twice as wide as long. Tergites 1-3 red (usually except base of petiolus), 4-7 black, the sixth with white apical band medially, the seventh with white apical mark.

Male

Black; scutellum white; seventh tergite with white apical mark; metapleura not white marked; postpetiolus with white, apical band; the following tergites not white marked; flagellum with white annulus; notauli obsolete; temple profile wider than in nortonii; *length 17 mm.*

The following are white: corners of clypeus, facial orbits broadly, frontal orbits up to lower ocellus, stripe on the middle of outer orbits, collare, subalarum, tegulae, apex of pronotal ridge, scutellum, postscutellum, short, apical band on postpetiolus, narrow apical band on sixth, broad one on seventh, tergite, apex of femora I and II ventrally, tibiae I and II dorso-laterally.

Remarks

The association of sexes and with it the synonymy as given above needs still further confirmation.

3. *Tricholabus adventicus* (Hopper)

Figs. 61, 62

Ichneumon adventicus Hopper, 1938, Amer. Ent. Soc. Trans., 64:101, ♂.

Types

Holotype.– ♂, Pennsylvania, Swarthmore. A.N.S.

Neallotype.– ♀, North Carolina, Raleigh. C.G.H.

Distribution

According to H. Townes 1951: "New York to Georgia. Upper Austral Zone". New records: ♂♂ and ♀, Florida, Ocala National Forest (C.N.C.); ♀, Alabama (U.S.N.M.).

Preamble

The male is chromatically distinguished by its very rich white color pattern which regularly includes large white marks on meta- and mesopleura, two short median marks on mesoscutum and apical bands on all tergites. Rare, extremely extensively white marked mutants of *nortonii* Cresson may be very similar, but always lack the white pattern on mesopleura and mesoscutum. Besides, the outline of temples is slightly different (see Figs. 59-62). The association of sexes, as given below, seems to be obvious, as the females share exactly the same kind of rich white color pattern of the thorax with the males.

Male

Black, with rich, white pattern; white are: scutellum, two short median lines on mesoscutum, large marks on mesopleura and metapleura, more or less incomplete W-pattern on propodeum, apical bands on all tergites and other markings to be mentioned below; flagellum with white annulus; length 12-14 mm.

Flagellum.–Black, with white annulus on segments 12 or 13 to 18 or 20; scape ventrally white.

Head.–Temples wider than in *nortonii*, not narrowed, broadly rounded. Black; the following are white: base of mandibles, clypeus and face except a common, median, longitudinal band, orbits around eyes broadly, narrowly interrupted on malar space, and narrowed or interrupted on temples.

Thorax.–Black; the following are white: collare, pronotal ridge, usually apex of pronotal base, tegulae, subalarum, scutellum, postscutellum, incomplete

W-pattern on propodeum (including usually apical part of area superomedia and of areae dentiparae), large mark on metapleura, smaller mark on mesopleura.

Legs.—Black; the following are white: extensive marks on coxae I and II, coxae III dorsally, femora I ventrally entirely and apically above, femora II ventrally except base and apically above, tibiae I and II except ventrally.

Abdomen.—Black; all tergites with white apical bands, which on the second to fourth tergites are laterally somewhat widened.

Female

Head and thorax black, with rich, white pattern; white are: scutellum, two short median lines on mesoscutum, large marks on metapleura and mesopleura, incomplete W-pattern on propodeum, all coxae partially and other markings to be mentioned below; abdomen ferruginous, approaching orange, with pale yellow pattern; postpetiolus with apical band, tergites 2 and 3 with latero-apical marks, sixth and seventh tergites with rather indistinct narrow apical bands; legs predominantly ferruginous; temples slightly inflated; length 11-14 mm.

Flagellum.—Bristleshaped, very slender, extremely attenuated, with acute apex, ventrally flattened but not widened beyond middle, with about 45 segments, about the sixteenth approximately square. Black with white annulus on segments 7 or 8 to 14 or 16.

Head.—Temple profile not narrowed, with strongly curved outline, temples a little inflated; cheek profile distinctly, but less, narrowed than in *nortonii*, with straight outline; malar space not quite as long as width of base of mandible; cheeks finely and sparsely punctured. Black, with rich, white pattern; the following are white: frontal orbits (strongly widened in the upper part), vertical and temple orbits and at least the upper part, sometimes the whole length of outer orbits (temple orbits usually strongly narrowed, sometimes entirely black), upper part of facial orbits (this mark usually separated from the eye by a very narrow, black interval), mark on base of mandibles.

Thorax.—Mesoscutum convex, strongly and moderately densely punctured; notauli basally distinct; scutellum considerably convex and raised above postscutellum; area superomedia distinctly longer than wide. Black; the following are white: collare, pronotal ridge, apex of pronotal base, subalarum, tegulae, scutellum, postscutellum, two short, apically converging, median lines on mesoscutum, apices of area superomedia and of area dentiparae, areae metapleurales predominantly, mark on lower apical part of mesopleura.

Legs.—Rufous; the following are black: basic color of all coxae, trochanters, apex and base narrowly of tibiae III, tarsi II and III, usually apex of femora III narrowly; all coxae dorsally white marked, coxae III usually dorsally entirely or predominantly white.

Abdomen.—Pale ferruginous; the following are pale yellow: broad, apical band on postpetiolus, more or less extensive apico-lateral marks on tergites 2 and 3, narrow, less distinct, apical bands on tergites 6 and 7.

Remarks

Some doubts have been mentioned by H. Townes (*in litt.*) whether *adventicus* Hopper should not be considered as a mere subspecies of *nortonii* Cresson, as both forms seem to replace one another geographically and also seem to be linked by certain females which combine the chromatic characters of head and thorax of *nortonii* with the entirely ferruginous abdomen of *adventicus*. After examination of ample material of both forms I came to the conclusion that

adventicus and *nortonii* are two distinct species, differentiated not only chromatically, but also in head structure (Figs. 59, 60); the seeming intergrades are distinctly different in head structure from *adventicus* and thus do not link the two forms. They rather represent a southern mutant or phase of *nortonii*.

4. *Tricholabus mitchelli*, new species

Types

Holotype.– ♀, New Jersey, Oceanville, 1.VII.1950, R. T. Mitchell, C.G.H.

Allotype.– ♂, New Jersey, Oceanville, 1.IX.1949, R. F. Springer, C.G.H.

Paratypes.–1 ♀, New Jersey, Newport, R. F. Myers; 1 ♂, New Jersey, Goshen, R. T. Mitchell. C.N.C. No. 7251. 7 ♀♀, New Jersey, Delaware, Virginia, South Carolina and 2 ♂♂, New Jersey and Maryland. Collection R. T. Mitchell. 2 ♂♂, Massachusetts (Woods Hole and Ipswich). M.C.Z. 3 ♂♂, Arkansas; 1 ♀, Massachusetts; 3 ♀♀, New York (Long Island); 1 ♂, Maryland. U.S.N.M. 3 ♀♀, New Jersey, Maryland, Georgia, 1 ♂, New Jersey, C.H.T. 1 ♀, New York (Long Island), 1 ♀, Maryland, C.G.H.

Distribution

New Jersey, Virginia, Delaware, Maryland, South Carolina (Collection R. T. Mitchell); Massachusetts (M.C.Z.): Massachusetts, New York State (Long Island) (U.S.N.M.); North Carolina, Georgia (C.H.T.).

According to R. T. Mitchell all his specimens were collected in salt marsh, mostly in lush growth of *Spartina alterniflora* Loisel. Evidently the distribution of this species so far as known is restricted to a narrow coastal belt of the Atlantic States from Georgia to Massachusetts.

Preamble

Females of this species are chromatically distinguished by the almost uniformly pale ferruginous color of head, thorax, abdomen and legs. In the males the basic color of head and thorax may be partially or predominantly black, while the abdomen is always – in contrast to all other eastern species – pale ferruginous, with or without yellow pattern. Flagellum of males without annulus. Propodeum long, the horizontal part distinctly longer than declivity, area superomedia narrow and considerably longer than wide.

Female

Uniformly pale ferruginous; yellowish-white are: scutellum, postscutellum, subalarum and mark on metapleura; flagellum dark with restricted, or without, annulus; apex of tibiae III and the tarsi III blackish infuscated; length 12-13 mm.

Flagellum.–Bristleshaped, very slender, ventrally flattened, but not widened beyond middle, extremely attenuated, acutely pointed at apex, with 45-46 segments. Blackish, basally more or less extensively brownish or ferruginous, without white annulus or with a reduced annulus on segments 11 or 12 to 13 or 14, rarely with distinct annulus on segments 11-14; scape ferruginous.

Head.–Temple profile scarcely narrowed, with strongly curved outline. Uniformly ferruginous.

Thorax.–Mesoscutum convex; notauli basally fairly distinct; scutellum fairly strongly convex and raised above postscutellum; horizontal part of propodeum somewhat longer than declivity; area superomedia strongly narrowed, fully twice as long as wide. Ferruginous; scutellum, postscutellum, subalarum and mark on metapleura, sometimes also collare and/or apex of pronotal ridge yellowish-white.

Legs.—Ferruginous; apex of tibiae III and the tarsi III blackish infuscated; sometimes also tarsi II somewhat infuscated.

Abdomen.—Narrow; third tergite approximately square or even slightly longer than wide; tergites 2-4 very densely punctured, nearly opaque. Uniformly ferruginous.

Male

Basic color of abdomen always ferruginous; head and thorax ferruginous combined with black, or entirely black, or entirely ferruginous, with white pattern of variable extent; apical band on postpetiolus and often apico-lateral marks on the following 2-3 tergites pale yellowish; flagellum without annulus; length 12-13 mm.

Flagellum.—Black; scape ventrally white.

Head.—Black, or ferruginous; the following are white: mandibles except teeth, clypeus and face except a common, median longitudinal, black or ferruginous band (sometimes clypeus entirely white), frontal orbits broadly, cheeks, except hind part near carina genalis and usually except apex at base of mandibles.

Thorax.—Color varies from predominantly or entirely ferruginous to (rarely) entirely black; the following are white: collare, pronotal ridge, tegulae, subalarum, scutellum, postscutellum, areae metapleurales predominantly, area superomedia and areae dentiparae apically or predominantly, sometimes also areae spiraculiferae partially, mark of varying size on the lower apical part of mesopleura, rarely mark on apex of pronotal base, sometimes short, lateral lines on mesoscutum near tegulae, exceptionally two median lines on mesoscutum.

Legs.—Ferruginous; basic color of coxae black, sometimes partially ferruginous; the following are white: coxae I and II apically more or less extensively, coxae III dorsally; the following are black, or blackish infuscated: usually base of trochanters, the apex of tibiae III, tarsi III more or less extensively, sometimes apex of femora III and the very base of tibiae III.

Abdomen.—Ferruginous; the following are usually pale yellowish: apical band on postpetiolus, apico-lateral marks on second and third, or sometimes even on the fourth tergites.

5. *Tricholabus foxleei*, new species

Types

Holotype.— ♀, British Columbia, Robson, 14.VI.1947, H. R. Foxlee. C.N.C. No. 7260.

Allotype.— ♂, British Columbia, Robson, 17.VI.1950, H. R. Foxlee. C.N.C.

Paratypes.—10 ♂♂, 2 ♀♀ from type locality. C.N.C. 8 ♂♂, 2 ♀♀ from type locality. C.G.H.

Distribution

British Columbia (C.N.C., C.G.H.); California (U.S.N.M.).

Female

Head and thorax including scutellum and flagellum uniformly black; wings usually distinctly infuscated; abdomen uniformly red; legs varying from uniformly red to predominantly black, coxae always black; length 12-13 mm.

Flagellum.—Bristleshaped, very slender, ventrally flattened, but scarcely widened beyond middle, extremely attenuated, with acute apex, with 45 segments. Uniformly black.

Head.—Temple profile comparatively strongly narrowed, with moderately curved outline. Uniformly black.

Thorax.—Mesoscutum and scutellum densely and strongly punctured; area superomedia gradually and strongly narrowed toward base; costulae obsolete. Uniformly black; sometimes scutellum and postscutellum partially obscure reddish.

Legs.—At least coxae and base of trochanters black; trochantelli, tibiae and tarsi sometimes uniformly red, soemtimes predominantly black, in the latter case at least middle of tibiae III and the tibiae and tarsi I and II predominantly red-brown.

Abdomen.—On the average a little stouter than in *nortonii* Cresson, the third tergite being usually about 1.5 times as wide as long (in *nortonii* approximately square). Uniformly red, the last two tergites apically usually indistinctly yellowish tinted.

Male

Head and thorax black, including scutellum and flagellum; wings distinctly infuscated; abdomen usually red, except the petiolus or the entire first segment, sometimes uniformly red, sometimes entirely black except narrowly reddish apical borders of tergites; legs varying from uniformly red to predominantly black; in the great majority of specimens rounded white mark on frontal orbits; length 11-14 mm.

Variability

(Males.)

Exceptionally apex of scutellum white, or facial orbits reddish; rarely outer orbits with whitish mark, sometimes scutellum and/or postscutellum partially obscure reddish; in one specimen last tergite with white anal mark.

6. *Tricholabus pax* (Dalla Torre)

Ichneumon pacificus Davis, 1898, Amer. Ent. Soc. Trans., 24:350, ♂ (preocc.).
Ichneumon pax Dalla Torre, 1902, Cat. Hym., v. 3, p. 964, ♂ (new name).
Tricholabus pax Townes, 1951, Syn. Cat., p. 296, ♂.

Types

Holotype.— ♂, Washington, Seattle. A.N.C.

Distribution

State of Washington.

Preamble

Similar to *foxleei*, but distinctly differing as a species by its considerably wider clypeus and its distinctly wider cheeks.

Male

Head and thorax including flagellum and scutellum uniformly black; wings distinctly infuscated; abdomen red except tergites 6 and 7 which are black; coxae and trochanters black, trochantelli, femora, tibiae and tarsi red; length 12 mm.

18. Genus *Pseudamblyteles* Ashmead[2]

Pseudamblyteles Ashmead, 1900, U. S. Nat. Mus. Proc. 23:18.

Type-species.—*Amblyteles palliatorius* (Gravenhorst). Orig. desig.

Physcoteles Berthoumieu, 1904, in Wytsman, Gen. Ins., fasc. 18, p. 51.

[2]See Part VII, Addenda, *Pseudamblyteles* Ashmead (additional new species described).

European authors tend to confuse this genus with *Amblyteles* Wesmael. The type species of the genus *Amblyteles*, the palaearctic species *Ichneumon armatorius* Foerster, is, as indicated by its name, "armed" by strong apophyses of the propodeum, approaching the degree of development presented by the genus *Hoplismenus* Gravenhorst. To me this character seems to indicate a generic degree of evolutional differentiation. I do not know at present any other species either in the Palaearctic or in the Nearctic region which shares this propodeal structure with *armatorius* Foerster. Therefore I confine the genus *Amblyteles* to the type species of the genus alone, and consider this genus as not being represented in North America, as far as our present knowledge permits. The different species listed under the genus *Amblyteles* in H. Townes, 1951, Synoptic Catalog, p. 294-295 will be distributed among the genera *Spilichneumon* Thomson, *Eutanyacra* Cameron, *Pseudamblyteles*, *Thyrateles* Perkins, *Limerodops* Heinrich and *Ctenichneumon* Thomson.

Pseudamblyteles can be distinguished from *Ichneumon* Linnaeus and *Thyrateles* in both sexes by the smaller gastrocoeli with obsolete or subobsolete thyridia, from *Ichneumon* additionally by the amblypygous apex of the female's abdomen. *Limerodops* and *Neamblymorpha* Heinrich differ from *Pseudamblyteles* in both sexes, but particularly in the female by the slender and elongate shape of the abdomen and by the structure of gastrocoeli.

The distinctive characters for the separation of *Pseudamblyteles* from *Eutanyacra*, *Spilichneumon* and *Ctenichneumon* are based predominantly on the male sex, which, in the last genus, displays a peculiar structure of flagellum, and in the other two genera, is distinguished by a medially projecting hypopygium. Females of *Ctenichneumon* have usually larger and deeper gastrocoeli and a coarser sculpture than *Pseudamblyteles*, but in a few species these differences are not significant and in such cases the generic position can scarcely be established without a knowledge and examination of the male. For the differentiating characters of *Eutanyacra* and *Spilichneumon* females, see these genera.

Flagellum.—Of female more or less slender but always bristleshaped, never strongly widened beyond middle and never very stout. Flagellum of male usually with a short row of 7-10 short-oval, rarely with a long row of 13-14 long bacilliform, tyloides.

Head.—Temples and cheeks never strongly widened or inflated; temple and cheek profiles more or less, usually considerably, narrowed, often with straight outlines; mandibles moderately slender, normal, the lower tooth sometimes reduced, the upper acute or slightly blunted, never obtuse.

Thorax.—Mesoscutum distinctly convex; scutellum from slightly to moderately convex; area superomedia of the quadrangular type, usually square or longer than wide, in males usually transverse; apices of area dentiparae, as in *Ichneumon*, sometimes acute, but never with considerable apopyses.

Legs.—From slender to moderately stout; coxae III of female never with scopa, tarsi I and II never widened.

Abdomen.—Of females amblypygous; in both sexes gastrocoeli shallow and small with obsolete or subobsolete thyridia; medium field of postpetiolus well defined, distinctly and regularly longitudinally striate.

Color.—Basic color of abdomen either black or ferruginous; in numerous species black and yellow or ferruginous and black banded. Sexual dimorphism in the latter group considerable, males being usually black and yellow banded; in the former group not very pronounced.

Biology.—Thanks to R. Hinz's observations (*in litt.*) we know that the female deposites her eggs into the larval stages of the host. Typical hosts of the genus are Noctuidae, particularly Noctuinae and Hadeninae. Several species have been found hibernating as adults. I presume that all females hibernate, as a large number of species has been collected in early spring before the appearance of males. However, many of these species have never been found in hibernating quarters. Their way of hibernation remains to be discovered.

Distribution.—Temperate Zones of the New and Old Worlds, including the Himalayan Region. As far as known, no species has invaded the tropics or the arctic.

Remarks

It is my conviction that the type-species of the genus *Diphyus* Kriechbaumer, the European species *Diphyus tricolor* Kriechbaumer, differs morphologically too slightly from the bulk of the species of the genus *Pseudamblyteles* to be regarded as a representative of a separated genus. Therefore *Pseudamblyteles* should actually be sunk into synonymy under *Diphyus*. I hesitated, however, to introduce a nomenclatorial change of such importance without a knowledge of the biology and of the other sex of the mentioned species.

Key to the Species of *Pseudamblyteles* Ashmead of Eastern North America

Females

1. Tergites 2-5 uniformly black. 2
   Tergites 2-5 not uniformly black. 6
2. Postpetiolus and extensive pattern on head and thorax ferruginous. (Wings slightly infuscated; length 13-16 mm.) ..... 12. *nigrotergops*, new species
   First segment entirely, head and thorax predominantly or entirely, black. 3
3. Legs red, except coxae, apex of tibiae III and the tarsi III; flagellum usually without annulus. (Scutellum almost always black; length 12-15 mm.) ..... 10. *ormenus* (Cresson)
   At least femora III black; flagellum with annulus. 4
4. Tibiae III with clear, yellow annulus, black at base and apex. (Frontal and vertical orbits ferruginous; tarsi pale ferruginous; length 11 mm.) ..... 11. *walleyi*, new species
   Tibiae III without clear yellow annulus, either uniformly black or basally reddish or yellowish-red. 5
5. Flagellum with 36-37 segments, the first scarcely twice as long as wide; temple profile scarcely narrowed, with curved outline; wings not infuscated; length 11-12 mm. ..... 13. *populorum*, new species
   Flagellum with 43-46 segments, the first about 2.5 times as long as wide; temple profile strongly narrowed, with straight outline; wings distinctly infuscated; length 13-16 mm. ..... 14. *carbo*, new species
6. Abdomen with yellow crossbands, or yellow lateral marks, sometimes also with yellow or white anal marks. (Basic color black, sometimes ferruginous; scutellum yellow.) 7
   Abdomen without yellow or white pattern. (Basic color ferruginous, sometimes black banded; scutellum ferruginous and/or yellow.) 13
7. Basic color of abdomen ferruginous. 8
   Basic color of abdomen black. 9
8. Basic color of thorax black; yellow pattern on base of second and third tergites; fair-sized species of 15 mm. length. ..... 4. *bizonatus* (Cresson) (erythristic mutant)
   Basic color of thorax ferruginous; yellow pattern on apex of second tergite; small species of 11 mm. length. (Tergites 1-3 or 4 with black, basal bands.) ..... 15. *micramoenus*, new species
9. All femora uniformly pale rufous, as are the tibiae; all tergites with regular yellow apical bands. (Propodeum yellow marked; length 12-13 mm.) ..... 2. *comptus* (Say)
   Femora predominantly black, tibiae medially yellow; not all tergites with regular, yellow apical bands, the second and third usually with yellow basal bands. 10

10. Tergites 4 and 5 with white apical bands, 6 and 7 with white apical marks; large species, 15-16 mm. long. (Tergites 2 and 3 usually basally yellow, turning into pale ferruginous or orange toward apex of segments, and/or apically black banded.) ..... 1. *robustus* (Cresson)

Tergites 4 and 5 without white apical bands, sixth and seventh tergite with or without anal marks; on the average smaller species, 12-15 mm. long. 11

11. Gastrocoeli subobsolete; fourth sternite without plica; first flagellar segment about twice as long as wide; second tergite finely and sparsely punctured, the third nearly smooth. (Usually less than basal half of second tergite and the third except a narrowed, black apical band yellow; sixth and seventh tergite with anal mark; length 13-14 mm.) ..... 3. *provancheri* (Cushman)

Gastrocoeli distinct; fourth sternite with more or less distinct plica; first flagellar segment nearly 3 times as long as wide; second tergite strongly and rather densely, third a little less densely and strongly, punctured. 12

12. Seventh tergite without anal mark, usually ferruginous or brownish; flagellum drawn out into a long, hair-thin apex; third tergite somewhat more strongly punctured than in the alternative species; length 15 mm. (In the holotype predominant color of abdomen black, second and third tergites with yellow basal bands; eastern specimens tend toward an erythristic predominant color of abdomen and toward reduction of the yellow bands on second and third tergites to irregular, lateral marks.) ..... 4. *bizonatus* (Cresson)

Seventh tergite black with white anal mark; attenuated flagellar apex not quite as long and thin as in the alternative species; third tergite less strongly punctured; length 12 mm. (Abdomen black, second and third tergites with broad, yellow, basal bands.) ..... 5. *effigialis*, new species

13. Scutellum entirely or partly yellow or yellowish. (Abdomen without or with infuscated or black basal bands on one or more tergites.) 14

Scutellum entirely brown or ferruginous. (Abdomen dark ferruginous or chestnut red, without basally black banded tergites.) 17

14. Mesoscutum black; tergites not black banded. (First flagellar segment about 3 times as long as wide, the fifth and sixth distinctly longer than wide; second and third tergites usually with irregular, pale yellowish patches laterally near base; tibiae III medially or predominantly yellow; length 15 mm.) ..... 4. *bizonatus* (Cresson)

Mesoscutum ferruginous; tergites 1-3 or 4 usually basally black banded. 15

15. Exterior side of femora III densely and evenly punctured, smooth between punctures; third tergite with indistinct, yellowish, apical band; small species, about 11 mm. long. (Femora and tibiae III without black pattern; tergites 1-3 or 4 basally more or less extensively black.) ..... 15. *micramoenus*, new species

Exterior side of femora III (except dorsally and apically) with a few scattered punctures, finely coriaceous between punctures; third tergite without yellowish, apical band; somewhat larger species, 12-14 mm. long. 16

16. At least basal half of femora III, often their whole length, ferruginous; tibiae III entirely ferruginous, or laterally infuscated only at the very apex; scutellum entirely yellow; mesoscutum a little convex, fairly strongly and densely punctured. (Tibiae III pale ferruginous, rarely slightly yellow tinted at the very base; length 13-14 mm.) ..... 6. *distinctipes*, new species

Femora III entirely, apex of tibiae III broadly black; scutellum with a distinct or indistinct ferruginous or red median longitudinal stripe, and the rest paler, usually yellow; mesoscutum flat, finely and more sparsely punctured, shiny. (Tibiae III medially distinctly yellowish tinted; length 10-13 mm.) 7. *interstinctus*, new species

17. Tibiae III without yellow annulus or tint. (Head predominantly ferruginous, thorax usually predominantly black; usually mesoscutum with V-shaped ferruginous pattern, sometimes varying to entirely ferruginous; length 12 mm.) 8. *flebilis* (Cresson)

Tibiae III medially more or less extensively yellow, black or blackish at base and apex. 18

18. Flagellum moderately long, with usually 39-41 segments, the first scarcely twice as long as wide, about the fifth square; length 11 mm. ..... 9. *amoenipes*, new species

Flagellum long, usually with 42-43 segments, the first fully 2.5 times as long as wide, about the twelfth approximately square; length 12-14 mm. ..... 8. *flebilis* (Cresson), variety probably, or perhaps distinct species. (Status not clear yet.)

Males

1. Mesoscutum with two long, narrow, longitudinal, yellow stripes. (Mesopleura and propodeum extensively yellow; tergites 2 and 3 predominantly yellow with black, basal bands, 4-7 black, with narrow, yellow, apical bands; length 13-15 mm.) ..... 2. *comptus* (Say)

   Mesoscutum without long, longitudinal, yellow stripes. 2

2. Femora III uniformly rufous. (Abdomen uniformly black, or tergites 2 and 3 partially to entirely ferruginous.) 3

   Femora III predominantly black. 4

3. Row of bacilliform tyloides starts on second flagellar segment; gastrocoeli on exterior side longer than medially wide; claspers apically wider and blunter than in the alternative species (Fig. 28); tergites 2 and 3 almost always black like the rest of the abdomen. ..... see Genus *Limerodops* Heinrich

   Row of bacilliform tyloides starts on the fifth flagellar segment, sometimes on the fourth; gastrocoeli about as long as wide; claspers apically more narrowed and differently shaped (Fig. 30); tergites 2 and 3 in majority of specimens partially ferruginous, or sometimes entirely ferruginous or black. (Length 15-18 mm.) ..... 10. *ormenus* (Cresson)

4. Abdomen predominantly or entirely black, tergites 2-3 or 4 sometimes with irregular, yellow lateral patches, but not with continuous, yellow basal bands. 5

   Tergites 2 and 3 with continuous, yellow, basal bands, or predominantly yellow. 6

5. Flagellum with narrow, bacilliform tyloides on segments 5-15, the longest reaching almost from bases to apices of segments; scutellum black, sometimes apically obscure ferruginous; abdomen uniformly black; length 13 mm. ..... 13. *populorum*, new species

   Flagellum with oval tyloides on segments 8-18 or 19, the longest not reaching apices of segments; scutellum yellow, exceptionally black; tergites 2-3 or 4 in about 50% of specimens with irregular, yellowish, lateral marks; length 15-19 mm. ..... 14. *carbo*, new species

6. Tergites 4-5 or at least the 5th with narrow, white, apical bands. (Second and third tergites basally yellow, turning orange toward apex of segments, sometimes apically broadly black; 6th and 7th tergites usually with white anal mark; biggest species, 19-21 mm. long.) ..... 1. *robustus* (Cresson)

   Tergites 4-5 without white apical bands. (Second tergite basally lemon yellow banded, the third usually predominantly or entirely yellow; length 12-15 mm.) 7

7. Propodeum extensively yellow marked. (Mesopleura not yellow marked; all trochanters yellow; length 16 mm.) ..... 8. *flebilis* (Cresson)

   Propodeum uniformly black. (Length 13-15 mm.) 8

8. Bacilliform tyloides on flagellar segments 4-19; gastrocoeli subobsolete; fourth sternite without plica; large, yellow mark on lower anterior part of mesopleura; all trochanters and trochantelli yellow. (Length 14-15 mm.) ..... 3. *provancheri* (Cushman)

   Short-oval tyloides on flagellar segments 6-14 or 15; gastrocoeli more distinct; fourth sternite usually with plica; mesopleura not yellow marked; trochanters III predominantly black. (Length 14-15 mm.) ..... 5. *effigialis*, new species

Remarks

Several other *Pseudamblyteles* males of the general chromatic pattern as treated in the key above beyond couplet No. 6 have been found in northeastern North America, but were not included in the key because it was not possible to clear their status and association. Under these circumstances all identifications achieved beyond couplet 6 should be regarded with reservation.

1. *Pseudamblyteles robustus* (Cresson)

Ichneumon robustus Cresson, 1867, Amer. Ent. Soc. Trans., 1:298, ♀.

Types

Holotype.— ♀, Canada. A.N.S.

Neallotype.— ♂, Quebec, Ile d'Orléans, 31.VII.1940. C.N.C. No. 7404.

Distribution

According to H. Townes, 1951: "Transcontinental in Canadian and Hudsonian Zones". New record: Maine, (Transition Zone) (C.G.H.).

Preamble

This species is morphologically and chromatically closely allied to the Palaearctic *Ichneumon gradatorius* Thunberg and perhaps its geographical vicariant. Both forms are the closest related to the type-species, *Ichneumon palliatorius* Gravenhorst. The association of sexes, as given below, seems to be obvious.

Female

Head and thorax black, scutellum yellow, face and clypeus predominantly yellowish; tergites 1 and 4-7 black, the latter with white apical pattern; tergites 2 and 3 pale ferruginous or orange, usually with black apical bands, basally often yellowish tinted; legs yellowish, coxae and femora (at least femora III) extensively black; length 15-16 mm.

Flagellum.—Bristleshaped, extremely attenuated toward apex, ventrally somewhat indistinctly flattened beyond middle and not widened, with 47 segments, the first more than twice as long as wide, about the ninth square. Black, segments 1-6 apically and ventrally more extensively, sometimes predominantly brownish, 7-15 or 16 yellowish-white.

Head.—Temple profile moderately, cheek profile more considerably narrowed, both with nearly straight outlines; malar space slightly longer than width of the base of mandible. Black; the following are yellowish: frontal and vertical orbits broadly up to the edge of occipital declivity, the upper part usually ferruginous tinted, lateral fields of face and clypeus; median field of face black or ferruginous, clypeus medially ferruginous tinted, sometimes somewhat infuscated.

Thorax.—Mesoscutum but slightly convex, densely punctured; notauli obsolete; scutellum scarcely raised above postscutellum, rather flat; area superomedia usually somewhat longer than wide, its sides converging from the insertion of the (usually subobsolete) costulae slightly to the base and to the apex as well. Black; the following are yellow, or pale ferruginous: collare, apex of pronotal ridge narrowly, tegulae, subalarum and scutellum.

Legs.—Long and slender. Coxae black; coxae I and II dorsally and apically more or less extensively yellow marked; trochanters and trochantelli yellow, trochanters III sometimes dorsally blackish; femora III entirely or predominantly black, femora I and II varying from ferruginous to extensively black, their apices yellowish; tibiae yellowish, apex of tibiae III black; all tarsi reddish-yellow.

Abdomen.—Fairly stout, the second tergite being apically wider than medially long; gastrocoeli triangular, shallow; short and narrow thyridia slightly indicated; second tergite densely punctured, punctures running into short striae or longitudinal rugosity between gastrocoeli; third tergite also densely, but a little more finely punctured. Tergites 1 and 4-7 black, 4-6 with white apical bands, the seventh with white apical mark; tergites 2 and 3 of pale ferruginous or orange color, basally often yellowish tinted, often with black, apical bands.

Male

Corresponds chromatically very closely with female; head and thorax black, scutellum yellow, face and clypeus yellow, face medially sometimes black marked; tergites 1 and 4- or 5-7 black; 5, or 4 and 5 usually with narrow, white, apical bands; white anal pattern on segments 6 and 7 usually reduced, or obsolete;

second and third, sometimes also the fourth, tergites yellow, or more or less extensively orange tinted, the second usually with broad, black apical band; legs as in female; length 19-21 mm.

Flagellum.—With narrow, lanceolate, fairly small tyloides on segments 8 or 9 to 18 or 19, the longest reaching the bases, but not quite the apices of segments. Black; scape ventrally yellow.

Head.—Malar space a little shorter than width of base of mandible. The following are yellow: mandibles, except teeth, face, clypeus, frontal orbits up to level of lower ocellus; middle of face often black marked.

Thorax.—Scutellum fairly strongly convex; area superomedia as wide as, or wider than long, narrowed toward apex. Black; as in the female are yellow: collare, pronotal ridge more or less extensively, subalarum, tegulae and scutellum.

Legs.—As in female; femora I and II almost always at least partially black.

Abdomen.—Black; tergites 2 and 3 often 4 basally or entirely lemon-yellow or orange, the second with broad, black, apical band; rest black, the fourth, or fourth and fifth with narrow, white, apical bands; white anal pattern on tergites 6 and 7 reduced or obsolete.

Remarks

Females hibernate as adults as proven by their appearance in early spring, but have not been found in hibernation quarters yet.

2. *Pseudamblyteles comptus* (Say)

Ichneumon comptus Say, 1836, Boston Journ. Nat. Hist., 1:229, ♂ ♀.
Ichneumon atrifrons Cresson, 1864, Ent. Soc. Phila. Proc., 3:157, ♀.
Amblyteles marginatus Provancher, 1882. Nat. Canad., 13:328, ♀.

Types

Holotypes.—Ichneumon comptus Say, ♂, "United States" (according to original description), lost; *Ichneumon atrifrons* Cresson, ♀, Illinois. A.N.S.; *Amblyteles marginatus* Provancher, ♀, Canada. Provincial Museum, Quebec. No. 34.

Distribution

According to H. Townes 1951: "Atlantic to 100° West in Transition and Upper Austral Zones".

Male

Black, with very rich yellow pattern; scutellum, extensive marks on propodeum, marks on prescutellar carinae, and usually narrow longitudinal stripes on mesoscutum, yellow; tergites 1-3 yellow with black basal marks, 4-7 black with yellow apical and lateral bands; legs predominantly yellow, femora III and apex of tibiae III black, in southern populations often rufous; length 13-15 mm.

Flagellum.—With bacilliform tyloides on segments 7 or 8 to 16 or 18. Black; ventrally sometimes brownish; scape ventrally yellow.

Head.—Yellow; the following are black: frons medially, ocellar and occipital region (the black color of the latter projecting on each side in the shape of a black band over the temple region to the border of the eyes), usually malar space narrowly, often the very apex of cheeks at base of mandible, sometimes markings on hind border of cheeks along the lower part of occipital carina.

Thorax.—Mesoscutum strongly and fairly densely punctured; scutellum fairly strongly convex. Black; the following are yellow: collare, pronotal ridge

broadly, usually mark on apex of pronotal base, rarely its whole length, tegulae, subalarum, scutellum, postscutellum, usually two narrow, longer or shorter, longitudinal stripes on mesoscutum, marks on prescutellar carinae, two large marks on propodeum (covering the areae dentiparae, superoexternae and usually spiraculiferae), carinal triangle, often prosternum.

Legs.—Yellow; the following are black: base of coxae I and II, coxae III ventrally, usually dorsal stripe on femora I and II, femora III entirely or predominantly, apex of tibiae III; apical segment of tarsi III and II infuscated; in southern specimens femora II and apex of tibiae often rufous.

Abdomen.—Basic color of tergites 1-3 yellow, of tergites 4-7 black, the latter with regular, narrow, yellow, apical and lateral bands; petiolus dorsally and basal bands on tergites 2 and 3 black.

Female

Black, scutellum yellow; all tergites with regular, yellow, apical bands; propodeum yellow marked; legs predominantly rufous; length 12-13 mm.

Flagellum.—Bristleshaped, very slender, extremely attenuated toward apex, ventrally flattened beyond middle but not widened, with 39-41 segments, the first fully 3 times as long as wide, about the twelfth square. Black, with white annulus on segments 7 or 8 to 12 or 13; the basal segments at apex narrowly and the scape ventrally, brownish.

Head.—Temple profile moderately narrowed with curved outline; malar space somewhat longer than width of base of mandible; apex of cheeks constricted at carina genalis. Black; frontal and vertical orbits broadly yellow up to border of occipital declivity; rarely clypeus laterally yellow, sometimes upper part of facial orbits narrowly yellowish.

Thorax.—Mesoscutum distinctly convex, longer than medially wide, densely punctured; notauli obsolete; scutellum convex, somewhat raised above postscutellum; area superomedia usually slightly longer than wide and somewhat narrowed toward base. Black; the following are yellow: collare, pronotal ridge, subalarum partially, sometimes tegulae partially, scutellum, postscutellum, two marks on propodeum (covering the areae dentiparae and often also the areae superoexternae partially or entirely), sometimes mark on carinal triangle.

Legs.—Slender. Rufous; basic color of coxae black; the following are yellow: all trochantelli, large dorsal and smaller latero-ventral mark on coxae II, coxae III dorsally predominantly.

Abdomen.—Black; gastrocoeli small and shallow, thyridia obsolete; second tergite densely, on the basal part rugosely, third tergite also densely but less strongly, punctured. Black; all tergites with regular, yellow, apical bands, which on the first and second tergites are somewhat broader than on the following tergites, and which on all tergites (except the first) continue laterally toward bases of segments.

3. *Pseudamblyteles provancheri* (Cushman)

Ichneumon bifasciatus Provancher, 1875, Nat. Canad., 7:23, 75, ♀, preocc.
Amblyteles provancheri Cushman, 1925, Wash. Acad. Sci. Jour., 15:388, ♀, new name.

Types

Holotype.—♀, Quebec. Provincial Museum, Quebec. No. 606.
Neallotype.—♂, Maine, Dryden, G. H. Heinrich. C.G.H.

Distribution

According to H. Townes 1951: "Quebec, Maryland, Virginia, Michigan". New records: ♀, Maine (C.G.H.); ♀, Ontario (C.N.C.).

Preamble

Chromatically rather similar to *bizonatus* Cresson, from which the female can be separated by the much finer sculpture of the anterior tergites, the stouter first flagellar segment, the subobsolete gastrocoeli, the not-folded fourth sternite and the longer hypopygium. The male is distinguished by its uniformly black propodeum and also by the reduced gastrocoeli.

Female

Black; inner orbits, pronotal ridge and scutellum yellow; usually less than basal half of second and the third tergite (except more or less narrow, apical, black band) yellow; white anal marks on tergites 6 and 7 (sometimes fairly indistinct); tibiae III yellow banded, femora and coxae black; length 13-14 mm.

Flagellum.—Bristleshaped, considerably attenuated and acutely pointed at apex, ventrally flattened beyond middle but not widened, with 43 segments, the first segment about twice as long as wide, the sixth square, the widest slightly wider than long. Black, segments 6 or 7 to 12 or 13 with white annulus.

Head.—Head and cheek profiles moderately narrowed, both with nearly straight outlines; malar space scarcely longer than width of base of mandible. Black; the following are yellow: inner orbits up to the edge of the occipital declivity, down to the lower end of eyes.

Thorax.—Mesoscutum rather flat, fairly strongly and densely punctured; notauli obsolete; scutellum flat, scarcely raised above postscutellum; area superomedia parallel-sided, usually slightly longer than wide; costulae distinct. Black; the following are yellow: collare, pronotal ridge, subalarum, scutellum; tegulae pale ferruginous.

Legs.—Moderately slender. Coxae, trochanters and femora black; tibiae yellow, tibiae II and III at the base narrowly, at the apex more broadly black, tibiae I at base and apex pale ferruginous tinted; trochantelli ferruginous, tarsi yellowish-ferruginous.

Abdomen.—Longish-oval, fairly shiny; median field of postpetiolus present, but not very prominent, finely, sometimes indistinctly, longitudinally striate; gastrocoeli subobsolete, indicated by a small, very shallow, almost smooth depression; fourth tergite without plica; second tergite finely and sparsely punctured, the following tergites almost smooth, the third sometimes (type specimen) with very fine and sparse punctures; hypopygium long, nearly reaching the very apex of abdomen; fourth sternite without plica. Black; basal half of second tergite and the third tergite, except a more or less narrow black apical band, yellow; the black apical color of both segments laterally projecting toward the base; sixth and seventh tergites with more or less distinct (sometimes fairly indistinct) anal marks; rarely also the fifth tergite with a small anal spot.

Male

Chromatically similar to female; black, scutellum and pronotal ridge yellow; propodeum not yellow marked; basal half or third of second tergite and the third tergite predominantly (except a narrow black, apical band) yellow; legs predominantly yellow; coxae III and femora III predominantly, tibiae narrowly at base and broadly at apex, black; length 14-15 mm.

Flagellum.—With narrow, bacilliform tyloides on segments 4-18, the longest reaching nearly from bases to apices of segments. Black, ventrally pale brown, scape ventrally yellow.

Head.—Malar space about half as long at width of base of mandible. Black; the following are yellow: mandibles, clypeus, face, cheeks including malar space, frontal and vertical orbits up to the edge of occipital declivity.

Thorax.—Mesoscutum slightly, scutellum moderately convex, area superomedia about as long as wide. Black; the following are yellow: collare, pronotal ridge, subalarum, tegulae, scutellum, apex of prosternum, a patch on lower half of mesopleura covering also the mesosternum to the sternauli and the border of prepectus.

Legs.—Yellow; the following are black: coxae III dorsally entirely or predominantly, ventrally and exteriorly except the more or less broadly yellow base, femora III except base, base of tibiae III narrowly and their apices broadly; tarsi with a slight ferruginous tint.

Abdomen.—Gastrocoeli shallow, close to subobsolete; second tergite fairly finely and densely, the third more finely punctured. Black; basal half of second and third tergite predominantly yellow, the latter with a narrow, black, apical band.

Remarks

Females hibernate as adults as proven by their appearance in early spring.

4. *Pseudamblyteles bizonatus* (Cresson)

Ichneumon bizonatus Cresson, 1864, Ent. Soc. Phila. Proc., 3:160, ♀.

Types

Holotype.—♀, Colorado. A.N.S.

Distribution

According to H. Townes 1951: "Quebec, Ontario, New York, Pennsylvania, Maryland, Alberta." Further record: Colorado (holotype). I have seen the specimens from New York, Pennsylvania and Maryland in C.H.T., which I think are conspecific with the holotype.

Preamble

In appearance and chromatic pattern somewhat similar to *provancheri* (Cushman) but well distinguished by the more elongate basal flagellar segments and the stronger sculpture of the anterior tergites. Extremely similar to *effigialis*, new species. For the differences see preamble of that species. I suspect that the type (from Colorado) represents a subspecies different from the more erythristic eastern populations. Because of lack of western material the subspecific difference can not be established yet.

Female

Black; inner orbits, face laterally, apex of pronotal ridge and scutellum yellow; tergites 2 and 3 with irregular, yellow, basal bands (sometimes reduced), apical three tergites usually ferruginous, the seventh without anal mark; in eastern specimens basic color of abdomen shows an erythristic tendency and black may partially, or entirely, be replaced by ferruginous; tibiae III yellow, except apex; coxae black; femora III black or rufous; length 15 mm.

Flagellum.—Bristleshaped, slender, extremely attenuated toward apex and acutely pointed, ventrally flattened beyond middle but not at all widened, with

43-45 segments, the first nearly three times as long as wide, the widest in ventral view distinctly longer than wide. Black, with white annulus on segments 6 or 7 to 12 or 13; scape ventrally yellowish or ferruginous.

Head.—Temple and cheek profile moderately narrowed, both with slightly curved outline; malar space about as long as the width of base of mandible; upper mandible tooth comparatively short, the lower small and scarcely separated by a gap. Black; the following are yellow: mandibles partially, frontal orbits up to vertex (gradually turning orange toward the latter), lateral fields of face, clypeus laterally or entirely; middle of clypeus and face usually orange, the latter sometimes black.

Thorax.—Mesoscutum but slightly convex; notauli obsolete; scutellum nearly flat; area superomedia square, or slightly wider than long; costulae subobsolete or distinct. Black; the following are yellow: collare, apex of pronotal ridge, subalarum, tegulae and scutellum.

Legs.—Rather slender. Black; apex of femora I and all tibiae yellow; apex of tibiae III broadly black, of tibiae II rufous tinted; trochantelli red-brown, tarsi pale rufous; femora I and II often partially rufous; in erythristic mutants all femora clear rufous.

Abdomen.—Median field of postpetiolus well defined, more or less distinctly, longitudinally striate; gastrocoeli small and shallow, thyridia subobsolete; second tergite strongly and rather densely, third somewhat less densely and a little less strongly punctured. Predominant color of holotype black; in eastern specimens usually partially, or entirely ferruginous; in holotype last two tergites brownish, in eastern specimens last three tergites ferruginous; no anal marks; second and third tergites with yellow, basal bands, which in some melanistic, or erythristic, specimens may be reduced to latero-basal marks.

5. *Pseudamblyteles effigialis*, new species

Types

Holotype.— ♀, Quebec, St. Sauveur, 22.VIII.1959, Gerd H. Heinrich. C.G.H.

Allotype.— ♂, Quebec, St. Sauveur, 22.VIII.1959, Gerd H. Heinrich. C.G.H.

Paratypes.—1 ♀, Ontario; 2 ♂♂, Quebec, 4 ♂♂, Maine. C.G.H.; 4 ♀♀, Ontario and New Brunswick. C.N.C. No. 7245.

Distribution

Quebec, Ontario, New Brunswick, Maine.

Preamble

Extremely similar to *bizonatus* (Cresson). Differs by the smaller size, and in the female, furthermore, by the apex of flagellum which is not drawn out quite as long and hair-thin as in *bizonatus*, by the third tergite being more finely and sparsely punctured and by the last tergites being black instead of ferruginous with a white anal mark on the seventh tergite. The relative length of femora seems to be slightly different in the two forms, measuring 3.9 times as long as medially wide (in lateral view) in *effigialis*, 4.22 times as long as medially wide in *bizonatus*. All these differences are subtle but sum up to a strong suggestion of specific differentiation. Nevertheless the distinction of these species may not be regarded as fully secured yet. The sexes were associated by observation of the type locality where no males of another *Pseudamblyteles* species were flying in the collecting day, and where, after special search, the holotype was found.

Female

Black; inner orbits, face laterally and scutellum yellow; tergites 2 and 3 with broad, yellow, basal bands, seventh tergite with white anal mark; tibiae III yellow except apex; coxae and femora black; length 12 mm.

Flagellum.—Bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally flattened beyond middle but scarcely widened, with 43 segments, the first nearly 3 times as long as wide, the thirteenth, and also the widest (in ventral view), approximately square. Black, with white annulus on segments 6, 7 or 8 to 13 or 14; scape ventrally ferruginous.

Head.—Temple and cheek profiles moderately narrowed, both with slightly curved outlines; malar space about as long as width of base of mandible; mandibles are as in *bizonatus*. Black; the following are yellow: frontal orbits up to vertex (turning orange toward the latter), facial orbits or entire lateral fields of face; clypeus and mandibles except teeth ferruginous; median field of face black.

Thorax.—Mesoscutum almost flat; notauli obsolete; scutellum flat; area superomedia usually slightly longer than wide, sometimes approximately square. Black; scutellum yellow; collare pale ferruginous; sometimes apex of pronotal ridge, subalarum, tegulae and postscutellum yellowish.

Legs.—Moderately slender. Black; apex of femora I and all tibiae yellow; apex of femora II pale ferruginous; apex of tibiae III broadly black, of tibiae II ferruginous tinted; trochantelli red-brown.

Abdomen.—Median field of postpetiolus well defined, more or less clearly, longitudinally striate; gastrocoeli small and shallow, thyridia subobsolete; second tergite densely and fairly strongly, the third sparsely and very finely punctured. Black; second and third tergites with broad, yellow, apical bands, the seventh with white anal mark; the yellow band on third tergite occupying usually more than half of the tergite, sometimes nearly the whole surface; both yellow bands usually becoming slightly orange tinted toward the apex; third tergite often narrowly infuscated at base.

Male

Black; apex of pronotal ridge and scutellum yellow; second and third tergites with black apical bands, the black band on the third tergite more or less narrowed; propodeum and pleura uniformly black; coxae I and II apically and all tibiae yellow; tibiae III apically broadly black, basally often narrowly infuscated; length 14-15 mm.

Flagellum.—With oval, fairly short tyloides on segments 6 (rarely 7) to 14 or 15, or 16, the longest by far not reaching apices of segments. Black ventrally as well as dorsally; scape ventrally yellow.

Head.—Temple profile distinctly narrowed, with slightly curved outline; malar space fully half as long as width of base of mandible. Black; the following are yellow: mandibles except teeth, clypeus, face, frontal orbits up to level of lower ocellus, usually small mark on lower part of outer orbits.

Thorax.—Mesoscutum slightly convex, fairly densely punctured; notauli usually obsolete; scutellum distinctly raised above postscutellum and convex; area superomedia usually about as long as wide; costulae more or less distinct. Black; the following are yellow: collare, apex of pronotal ridge, rarely its whole length, subalarum, tegulae, scutellum.

Legs.—Black and yellow; the following are yellow: coxae I and II except apices, all trochantelli, trochanters I and II, apex of trochanters III, apex and

ventral side of femora I and II (the latter ventrally at base usually blackish), all tibiae (tibiae III apically broadly black, basally usually narrowly infuscated); tarsi orange tinted, especially tarsi III.

Abdomen.—Fairly narrow, second tergite somewhat longer than apically wide, the third square; median field of postpetiolus and interval of gastrocoeli more or less distinctly longitudinally striate; gastrocoeli externally a little longer than medially wide. Black; second tergite with broad, yellow basal band, the third usually predominantly yellow with narrow, black, apical band.

6. *Pseudamblyteles distinctipes*, new species

Fig. 37

Types

Holotype.—♀, Maine, Dryden, hibernating, Gerd H. Heinrich. C.G.H.

Paratypes.—6 ♀♀, Ontario (Ottawa, Harold, Grimsby); 1 ♀, Quebec (Montreal); 1 ♀, New York, Ithaca. C.N.C. No. 7241. 3 ♀♀, Maine, Dryden; 1 ♀ New York, York; 1 ♀ Ontario, Ottawa. C.G.H.

Distribution

Quebec, Ontario, New York (C.N.C.); Maryland, Ohio, North Carolina (C.H.T.); Maine (C.G.H.).

Preamble

This species belongs to a complex of very closely allied and very similar forms; in chromatical characters it resembles strongly *subfuscus* Cresson, described from Colorado, which, however, has distinctly more elongate flagellar segments, more slender femora III and much finer sculpture of tergites 2 and 3. Among the related species of eastern North America, *distinctipes* can be recognized by the color of legs III, which have the femora either black in the apical half only or entirely ferruginous, while the tibiae are uniformly ferruginous, without conspicous black apex and without yellow annulus, although often slightly yellowish tinted near the base.

Female

Ferruginous, scutellum yellow, usually basal bands on tergites 1-4, sterna, all coxae and the pleura predominantly black; femora III usually apically more or less extensively (often their apical half) black, sometimes entirely ferruginous; tibiae III ferruginous, apically without any, or without conspicous, black pattern; flagellum tricolored; mesoscutum and second tergite fairly strongly and densely punctured; length 13-14 mm.

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally not very distinctly flattened beyond middle, not widened, with 43-44 segments, the first more than twice as long as wide, about the sixth or seventh square. Segments 1-5 or 6 ferruginous, 6 or 7 to 13 or 14 with white annulus, apex black; scape ferruginous.

Head.—Temple profile distinctly narrowed, with slightly curved outline; cheek profile moderately and somewhat less narrowed than in the similar species *interstinctus*, new species, slightly curved; malar space about as long as width of base of mandibles; mandibles stoutish, with fairly short, somewhat blunted apical teeth (Fig. 37). Uniformly ferruginous, including ocellar region.

Thorax.—Mesoscutum slightly convex, fairly densely and somewhat stronger punctured than in *interstinctus;* notauli basally indicated; scutellum flat, not raised; area superomedia usually longer than wide and nearly parallel-sided. Ferruginous; scutellum and often subalarum yellow; the following are black:

middle of pronotum, prosternum, prepectus, mesosternum, mesopleura usually except a ferruginous median band, areae coxales, areae metapleurales predominantly or entirely, scutellar and propodeal sutures and a small patch at anterior border of median lobe of mesoscutum.

Legs.—Moderately slender. Ferruginous; coxae entirely, trochanters predominantly black (in southern specimens coxae and trochanters tend to become ferruginous); apical half, or apex of femora III, usually black; tibiae III ferruginous as the rest, sometimes laterally slightly infuscated at the very apex, sometimes somewhat yellowish tinted at the base.

Abdomen.—Median field of postpetiolus densely, longitudinally striate, its apex laterally not sharply defined; gastrocoeli triangular, shallow; second tergite densely and fairly strongly, the third also densely but a little less strongly punctured; base of second tergite between gastrocoeli shortly, longitudinally striate, ferruginous; tergites 1-4 with black basal bands, the band on the fourth tergite often broader than on the others; usually the second tergite also with a narrow, black, apical border line.

Remarks

Females were found hibernating in rotten stumps.

7. *Pseudamblyteles interstinctus*, new species

Types

Holotype.— ♀, Maine, Dryden, hibernating, Gerd H. Heinrich. C.G.H.

Paratypes.—6 ♀♀, Ontario (Hymers, Ottawa, Merivale, Mer Bleue, Hastings Co., Jockvale); 6 ♀♀, Quebec (Aylmer, Knowlton, Cascapedia, Old Chelsea, Mount Joli). C.N.C. No. 7242. 1 ♀, Maine, Mt. Bigelow; 2 ♀♀, Ontario, Nipigon; 1 ♀, Ontario, Beardmore. C.G.H.

Distribution

Maine, Ontario (Nipigon) (C.G.H.); Ontario, Quebec (C.N.C.); New Hampshire (M.C.Z.).

Preamble

Very similar to *distinctipes*, new species. On the average smaller in size, cheeks somewhat more narrowed; mesoscutum more flat, more finely punctured and more shiny without trace of notauli; femora III always entirely, femora II often partially, apex of tibiae III broadly black; scutellum not entirely yellow but usually medially ferruginous, laterally yellowish tinted.

Female

Ferruginous; scutellum usually yellowish tinted except along the middle; usually narrow, black, basal bands on tergites 1-4 or on some of these tergites; sterna, all coxae and the pleura predominantly or entirely black; femora III entirely, tibiae III broadly black at apex; tibiae III medially more or less distinctly yellow tinted; flagellum tricolored; mesoscutum rather finely and sparsely punctured; length 10-13 mm.

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally moderately distinctly flattened beyond middle, not widened, with 43-46 segments, the first more than twice as long as wide, about the fifth square. Segments 1-5 or 6 ferruginous or predominantly brownish, 6 or 7 to 13 or 14 with white annulus, apex black; scape ferruginous, dorsally usually blackish.

Head.—Temple and cheek profiles distinctly narrowed, the former with

slightly curved, the latter with straight outline; malar space scarcely shorter than the width of base of mandible; mandibles stoutish, with short, somewhat blunted apical teeth. Ferruginous, ocellar region and supraantennal cavities black.

Thorax.—Mesoscutum flat, fairly finely and scarcely punctured, shiny; no indication of notauli; scutellum flat, not raised; area superomedia usually longer than wide and nearly parallel-sided. Ferruginous; scutellum usually laterally yellowish tinted, ferruginous along middle; the following are black: pronotum usually predominantly (except pronotal ridge and collare), or at least medially, prosternum, prepectus, mesosternum, mesopleura (sometimes medially more or less extensively ferruginous), areae coxales, areae metapleurales predominantly, scutellar and propodeal sutures (sometimes base of propodeum more extensively), sutures around mesoscutum and a small patch on anterior end of median lobe of mesoscutum.

Legs.—Moderately slender. Ferruginous, coxae entirely, trochanters predominantly, femora III entirely, femora II often partially and the apex of tibiae III broadly black; middle of tibiae more or less intensively yellow.

Abdomen.—Sculpture and gastrocoeli as in *distinctipes.* Ferruginous; tergites 1-4 usually with more or less complete, narrow, black, basal bands which are often obsolete on the second tergite; postpetiolus often with a narrow, black apical stripe, especially on the lateral fields.

Remarks

Females were found hibernating in rotten stumps.

8. *Pseudamblyteles flebilis* (Cresson)

Figs. 35, 41

Ichneumon flebilis Cresson 1877, Amer. Ent. Soc. Trans., 6:164, ♀.

Types

Holotype.—♀, Canada. A.N.S.
Neallotype.—♂, Maine, Dryden. C.G.H.

Distribution

According to H. Townes 1951: "Canada". New records: Transition Zone: Ontario, Quebec (C.N.C.); New Hampshire, Maine (C.G.H.). Woods dweller.

Preamble

If my concept is correct, the holotype of *flebilis* represents an extremely erythristic, rather rare mutant of the most variable and at the same time the most common of the *Pseudamblyteles* species of northeastern America. In the following I shall give a short diagnosis of the holotype and separately a short diagnosis of the supposed chromatic mutant of this species, which is, by far, the most common color phase in New England and southeastern Canada. There are intergrades of various degrees of erythrism between these two mutants. The association of sexes as given below is tentative and merely based on the fact of their equal frequency and equal habitat: woodland, particularly clearings surrounded by woods of the Transition Zone type.

Female

(Holotype.)

Ferruginous, including scutellum, the entire head, mesoscutum, the greatest part of pronotum, of propodeum, of legs and the abdomen except petiolus;

sterna, mesopleura and part of metapleura black; flagellum tricolored, the base up to the white annulus being pale ferruginous, the apex beyond annulus black; length 12 mm.

(Usual chromatic pattern.)

Head predominantly and abdomen except the first segment ferruginous, the latter never black banded; basic color of thorax black, a V-shaped pattern on mesoscutum and the scutellum ferruginous (in a few mutants mesoscutum almost entirely black or almost entirely ferruginous), propodeum sometimes ferruginous marked; coxae, trochanters and femora III black; tibiae and tarsi brownish, tibiae III apically, sometimes predominantly, black; flagellum black with white annulus; length 12 mm.

Flagellum.—Bristleshaped, slender, considerably attenuated toward apex and acutely pointed, ventrally flattened beyond middle but not widened, with 42-43 segments, the first fully 2.5 times as long as wide, the twelfth or thirteenth approximately square. Black, with white annulus on segments 6 or 7 to 13; basal segments before annulus sometimes partially brownish, in type ferruginous; scape basally or entirely ferruginous.

Head.—Temple profile strongly, cheek profile distinctly narrowed, both with straight outlines; malar space about as long as width of base of mandible. In the type uniformly ferruginous; in most specimens predominantly ferruginous, with the hind part of cheeks along the carina genalis (to a varying extent), the supraantennal cavities and the ocellar region black.

Thorax.—Mesoscutum rather flat, finely and sparsely punctured, shiny; notauli obsolete; scutellum flat and shiny; area superomedia usually a little longer than wide, sometimes square, its apical border and the costulae weak or obsolete. Varying from predominantly ferruginous to predominantly black; the following are almost always ferruginous: collare, pronotal ridge, tegulae, scutellum and a V-shaped pattern on the mesoscutum, the "V" tending to increase in width, and sometimes the ferruginous color extends over the greater part of or entire mesoscutum; often subalarum and postscutellum ferruginous, sometimes the propodeum ferruginous marked or predominantly ferruginous, exceptionally pleura partially ferruginous.

Legs.—Moderately slender. Coxae, trochanters and femora III usually black, in the type the former partially, the latter entirely, ferruginous; trochantelli, tibiae and tarsi red-brown, tibiae III apically more or less extensively black, sometimes predominantly blackish, sometimes entirely ferruginous; femora I usually ventrally and apically, sometimes also femora II partially, ferruginous; in the type all femora ferruginous.

Abdomen.—Longish-oval; median field of postpetiolus clearly defined, longitudinally striate; gastrocoeli small and shallow, thyridia subobsolete; second tergite fairly strongly and densely, the third somewhat less strongly and densely, punctured. Red-brown; the first segment usually, sometimes also the gastrocoeli, black; sometimes postpetiolus partially or entirely red-brown; no apical or basal black bands on tergites.

Remarks

Females have been found hibernating.

Male

(Tentative.)

Black; whole length of pronotal ridge and scutellum yellow; second tergite yellow with broad, black, apical band, the third predominantly yellow with nar-

row, black, apical band, or entirely yellow; usually postpetiolus apically yellow marked; propodeum extensively yellow marked; pleura uniformly black; coxae I and II predominantly, coxae III usually apically, yellow; tibiae and tarsi yellow, apex of tibiae III black, tarsi III slightly rufous tinted; length 16 mm.

Flagellum.—With oval tyloides on segments 4 or 5 to 16 or 17, with 43-46 segments. Black ventrally and dorsally; scape ventrally yellow.

Head.—Black; the following are yellow: mandibles except teeth, clypeus, face, frontal orbits up to level of lower ocellus.

Thorax.—Mesoscutum slightly convex, fairly strongly and moderately densely punctured; notauli basally indicated; scutellum fairly strongly raised above postscutellum; area superomedia usually wider than long. Black; the following are yellow: collare, pronotal ridge, pronotal base usually apically or sometimes its whole length, tegulae, subalarum, scutellum, postscutellum and two large, usually medially connected, marks on the propodeum, covering the areae posteroexternae, areae spiraculiferae and areae dentiparae (the latter two except base) and upper part of area posteromedia.

Legs.—Black and yellow; black are: base of coxae I and II narrowly, coxae III except apex, femora I and II dorsally in part, femora III, apex of tibiae III; all trochanters and trochantelli always yellow; tarsi II and III slightly orange tinted.

Abdomen.—Black; second tergite yellow with broad, black, apical band, the third usually predominantly yellow with black, apical border, or entirely yellow; rarely also the fourth tergite yellow marked, or extensively yellow; last tergite usually apically obscure reddish.

Remarks

There is no way to tell whether the male described above belongs to *flebilis* or *distinctipes*, new species, or *interstinctus*, new species, all occurring in about the same habitat; the frequency alone hints in favor of *flebilis*. Further observation and confirmation are necessary.

9. *Pseudamblyteles amoenipes*, new species

Types

Holotype.—♀, Maine, Dryden, 4.V.1952, Gerd H. Heinrich. C.G.H.

Paratypes.—3 ♀♀, Quebec (Cherry River, Aylmer, Laniel). C.N.C. No. 7246.

Distribution

Maine, Quebec.

Preamble

A little smaller than *distinctipes*, new species, and *flebilis* (Cresson). Closely related and chromatically very similar to the latter, but distinctly differing by shorter basal flagellar segments, more finely punctured third tergite and particularly by the color of tibiae which are yellow with infuscated or black apex.

Female

Head ferruginous except the black middle of face, frons, and the ocellar, occipital and temple regions; thorax black except the ferruginous collare, pronotal ridge, V-shaped pattern on mesoscutum, subalarum, tegulae, scutellum and postscutellum; abdomen chestnut-red except first segment; legs predominantly black, all tibiae yellow, infuscated narrowly at base, broadly at apex; length 11 mm.

Flagellum.—Bristleshaped, moderately long and not quite as slender as in *flebilis,* considerably attenuated and acutely pointed at apex, ventrally distinctly flattened and scarcely widened beyond middle, with 39-41 segments, the first scarcely twice as long as wide, about the fifth square. Black, with white annulus on segments 6 or 7 to 12; scape ventrally ferruginous; basal segments apically brownish.

Head.—Temple profile strongly, cheek profile distinctly narrowed, outline of the former not quite as straight as in *flebilis;* malar space about as long as width of base of mandible. Ferruginous with somewhat more extensive black pattern than in *flebilis;* the following are black: median field of face partially or entirely, frons (except frontal orbits), ocellar region, occipital region and temple region extensively.

Thorax.—Mesoscutum rather flat; finely and more densely punctured than in *flebilis,* less shiny; notauli obsolete; scutellum scarcely convex; area superomedia rectangular, slightly longer than wide. Black; the following are ferruginous: collare, pronotal, ridge, tegulae, subalarum, V-shaped pattern on mesoscutum, scutellum and postscutellum.

Legs.—Femora slightly shorter than in *flebilis.* Black; trochantelli and apex of femora I red-brown; all tibiae yellow, narrowly infuscated at bases, broadly at apices; apices of tibiae III black; tarsi pale ferruginous, tarsi III somewhat infuscated.

Abdomen.—Apical part of median field of postpetiolus scarcely prominent; postpetiolus and base of second tergite between gastrocoeli longitudinally striate; gastrocoeli small and shallow, thyridia subobsolete; second tergite distinctly and densely punctured, the third sparsely and more finely punctured than in *flebilis.* First segment black, its apex and tergites 2-7 chestnut-red; no black bands.

Remarks

The collecting date of the holotype proves sufficiently that the female hibernates.

10. *Pseudamblyteles ormenus* (Cresson)

Ichneumon ormenus Cresson, 1864, Ent. Soc. Phila. Proc., 3:141, ♀.
Ichneumon tenebrosus Cresson, 1864, Ent. Soc. Phila. Proc., 3:145, ♂ (preocc.).
Ichneumon luctus Cresson, 1865, Ent. Soc. Phila. Proc., 4:250 (new name).
Ichneumon mellipes Cresson, 1867, Amer. Ent. Soc. Trans., 1:295, ♂.
Ichneumon quebecensis Provancher, 1875, Nat. Canad., 7:24, 77, ♂.
Pseudamblyteles neomexicanus Ashmead, 1901, Psyche, 9:147, ♂.
Amblyteles ormenus Townes, 1951, Synoptic Catalog, p. 294-295, ♀ ♂.

Types

Holotypes.—*Ichneumon ormenus* Cresson, ♀, Pennsylvania. A.N.S.; *Ichneumon tenebrosus* Cresson, ♂, Colorado. A.N.S.; *Ichneumon mellipes* Cresson, ♂, Canada. A.N.S.; *Ichneumon quebecensis* Provancher, ♂, Quebec, Provincial Museum, Quebec, No. 663; *Pseudamblyteles neomexicanus* Ashmead, ♂, New Mexico. U.S.N.M.

Distribution

According to H. Townes 1951: "Transcontinental in Canadian Zone and in cooler part of Transition Zone".

Preamble

This is the single known species of the genus in eastern North America combining black basic color of head, thorax and abdomen with clear rufous legs; in the males the second and third tergites are more often partially or entirely ferruginous (variety *quebecensis* Provancher) than uniformly black. One of the most common species, inhabiting semi-open woodlands. Females must hibernate, as they appear at the beginning of May, while males are flying from the second half of June to August; nevertheless, no specimen has been found in hibernation quarters yet. Some prepared females with abdomen narrowed in the process of drying and shrinking may approach the appearance of *Limerodops*, but can easily be distinguished by the shape of gastrocoeli, the stouter flagellum and the stronger sculpture of abdomen.

Female

Black, including scutellum and flagellum; frontal orbits usually narrowly, rarely also scutellum apically ferruginous; legs red, except coxae; apex of tibiae III and the tarsi III black; length 12-15 mm.

Flagellum.—Bristleshaped, considerably attenuated toward apex, ventrally flattened, but not widened beyond middle, with 47-49 segments, the first about 2.5 times as long as wide, about the tenth square. Uniformly black, including scape, very rarely with white annulus.

Head.—Temple and cheek profiles considerably narrowed with straight outlines; malar space distinctly longer than width of base of mandible. Black; frontal orbits usually narrowly ferruginous.

Thorax.—Mesoscutum but slightly convex, fairly strongly and densely punctured, somewhat shiny; notauli usually indicated at base; scutellum slightly raised above postscutellum, dorsally flat and fairly smooth, sparsely punctured; area superomedia about as long as wide, or slightly longer, usually somewhat narrowed toward area basalis in the anterior part. Uniformly black; rarely apex of scutellum ferruginous, exceptionally yellowish.

Legs.—Moderately slender. Red; coxae black, apices of tibiae III and the tarsi III black, or infuscated.

Abdomen.—Longish-oval, more or less tapering toward apex; median field of postpetiolus clearly defined, finely (but not densely) and longitudinally striate; gastrocoeli about as long as wide, shallow, thyridia obsolete; fourth sternite without plica; hypopygium long and almost bare as in *Limerodops* Heinrich; second tergite moderately strongly and fairly densely, the third finely and toward the apex sparsely, punctured. Uniformly black.

Male

Black with restricted yellow pattern; scutellum and pronotal ridge more or less extensively yellow; abdomen black, or, in majority of specimens, second and third tergites basally, or predominantly, sometimes entirely, ferruginous; legs predominantly pale rufous with yellow pattern; length 15-18 mm.

Flagellum.—With long, narrow, bacilliform tyloides on segments 5 or 6, to 16, 18 or 19, forming an almost uninterrupted ridge. Black, scape ventrally yellow.

Head.—Temple profile strongly narrowed, with straight outline; malar space more than half as long as width of base of mandible. Black; the following are yellow: mandibles, except teeth, clypeus, face and frontal orbits.

Thorax.—Mesoscutum strongly and densely punctured; scutellum somewhat

raised above postscutellum; area superomedia usually square, or a little wider than long. Black; the following are yellow: scutellum, tegulae, subalarum, pronotal ridge apically or more extensively.

Legs.—Pale rufous and yellow; coxae I and II predominantly yellow, coxae III black; trochanters I and II entirely, III ventrally yellow (dorsally black or rufous); all femora pale rufous, all tibiae and tarsi predominantly yellowish, tibiae III narrowly black at apex, or with a lateral black mark apically.

Abdomen.—Tergites 2-4 densely punctured, alutaceous between punctures and almost opaque, the second tergite basally in the middle longitudinally striate, or rugose. Black; second and third tergites varying chromatically between entirely black and entirely ferruginous, usually basally ferruginous, or ferruginous with black apical bands.

Remarks

Female hibernate as adults as proven by their appearance in early spring.

11. *Pseudamblyteles walleyi*, new species

Types

Holotype.— ♀, Ontario, Smoky Falls on Mattagami River, 6.VII.1934, G. S. Walley. C.N.C. No. 7226.

Distribution

Northern Ontario.

Female

Black, including scutellum; flagellum with white annulus; tibiae III yellow banded, black narrowly at base, broadly at apex; all tarsi and tibiae I and II predominantly pale ferruginous, femora and coxae black; length 11 mm.

Flagellum.—Bristleshaped, moderately long, long attenuated and acutely pointed at apex, ventrally flattened but not widened beyond middle, with 40 segments, the first about two times as long as wide, the fifth square. Black with white annulus on segments 6-12; basal segments apically brownish tinted.

Head.—Temple and cheek profile considerably narrowed with straight outlines; malar space fully as long as the width of base of mandible. Black; the following are pale ferruginous: apex of clypeus, upper part of facial orbits, frontal and vertical orbits up to the edge of occipital declivity.

Thorax.—Mesoscutum flat, fairly finely and moderately densely punctured; notauli scarcely indicated at the very base; scutellum flat, scarcely raised above postscutellum; area superomedia considerably longer than wide, parallel-sided. Black; collare, extreme apex of pronotal ridge and apex of scutellum narrowly ferruginous.

Legs.—Moderately slender. Coxae, trochanters and femora black; apices of femora I and II and the trochantelli ferruginous; tibiae I and II pale ferruginous, slightly infuscated at apices, somewhat yellowish tinted toward bases; tibiae III pale yellow, narrowly black at base, broadly black at apex; all tarsi pale ferruginous.

Abdomen.—Median field of postpetiolus clearly defined, longitudinally striate with a few punctures near the apex; gastrocoeli small and shallow, with narrow, indistinct thyridia; second tergite fairly finely and densely punctured, between gastrocoeli with short, longitudinal striae; third tergite very finely and sparsely punctured in the basal part, the sculpture becoming almost smooth toward the apex of the segment. Uniformly black.

12. *Pseudamblyteles nigrotergops*, new species

Types

Holotype.– ♀, Ontario, Hymers, 31.V.1908, Horace Dawson. C.N.C. No. 7229.

Paratypes.–1 ♀, (no locality); 1 ♀, Quebec. C.N.C. 1 ♀, Ontario, Almonte. C.G.H.

Distribution

Ontario, Quebec.

Preamble

This species strongly resembles chromatically *Ichneumon nigrotergus* Davis (South Dakota), the type specimen of which, however, represents a true *Ichneumon* species. Characteristic for *Pseudamblyteles nigrotergops* is the bright ferruginous color of the postpetiolus contrasting with the deep black of the following tergites.

Female

Wings slightly infuscated; notauli basally distinct; head and thorax, including scutellum, extensively or predominantly ferruginous; postpetiolus ferruginous, tergites 2-5 deep black; legs ferruginous, coxae III and femora III extensively or predominantly black; flagellum with annulus; length 13-16 mm.

Flagellum.–Bristleshaped, extremely attenuated and acutely pointed at the apex, ventrally flattened beyond middle but not widened, with about 44 segments, the first about 2.3 times as long as wide, the ninth or tenth square. Tricolored: scape and basal five segments entirely or predominantly ferruginous, turning gradually into pale yellow toward the sixth segment, segments 6-15 or 16 with pale yellowish annulus, apex black.

Head.–Temple profile moderately narrowed with slightly curved outline, cheek profile more distinctly narrowed with nearly straight outline; malar space scarcely as long as width of base of mandible. Ferruginous; the following are black: supraantennal cavity, ocellar region and occipital region.

Thorax.–Mesoscutum slightly convex, finely and fairly densely punctured; basal part of notauli distinct; scutellum scarcely raised above postscutellum, dorsally flat; area superomedia scarcely longer than wide, usually slightly narrowed from costulae toward apex and toward base. Ferruginous; the following are black: middle of pronotum more or less extensively, base and apex of median lobe of mesoscutum narrowly, lateral lobes entirely, prosternum, prepectus, mesosternum, band on mesopleura below subalarum, area before coxae II, areae coxales or metapleura predominantly, usually base and apex of propodeum, scutellar sutures.

Legs.–Moderately slender. Ferruginous; the following are black: at least base of coxae I and II narrowly and coxae III laterally extensively (sometimes coxae II and III entirely black), trochanters usually dorsally, femora III partially (exteriorly) or entirely, apex of tibiae III.

Abdomen.–Median field of postpetiolus sharply defined, strongly longitudinally striate; gastrocoeli slightly impressed, with narrow, indistinct thyridia, their interval longitudinally striate; second tergite very densely and fairly strongly, the third somewhat finer and less densely, punctured. Postpetiolus or first segment (except base narrowly) bright ferruginous; tergites 2-7 deep black, the sixth and seventh dorsally indistinctly obscure ferruginous marked.

13. *Pseudamblyteles populorum*, new species

Types

Holotype.– ♀, Alberta, Calgary, ex *Brachylomia populi* Strecker. C.N.C. No. 7227.

Allotype.– ♂, Saskatchewan, Roche Percee, 4-8.VII.1927, E. & S. Criddle. C.N.C. No. 7227.

Paratypes.–1 ♀, Alberta, locality and host as for type specimen; 1 ♂, Saskatchewan, locality and data as for allotype specimen. C.N.C.

Host

Brachylomia populi Strecker.

Distribution

Alberta, Saskatchewan.

Preamble

Related and somewhat similar to *Pseudamblyteles walleyi*, new species, but temples and cheeks wider.

Female

Black; mesoscutum and propodeum partially, scutellum, face and clypeus entirely pale ferruginous; femora, coxae and trochanters predominantly black; tibiae and tarsi predominantly yellowish-ferruginous; flagellum with annulus; length 11-12 mm.

Flagellum.–Bristleshaped, relatively short, considerably attenuated with acute apex, ventrally flattened beyond middle but not widened, with 36-37 segments, the first scarcely twice as long as wide, the sixth or seventh square. Black; segments 8-12 with white annulus, segments 1-7 partially (most extensively on ventral side) ferruginous; scape ventrally ferruginous.

Head.–Temple profile scarcely narrowed with curved outline, cheek profile slightly narrowed with slightly curved outline; malar space short, scarcely as long as width of base of mandible; cheeks fairly wide between eyes and carina genalis. Black; the following are ferruginous: mandibles except teeth, clypeus, face, apical part of cheeks (including malar space but not including the hind half along carina genalis), frontal and vertical orbits.

Thorax.–Mesoscutum flat, finely and not densely punctured; notauli obsolete; scutellum scarcely raised above postscutellum, dorsally flat and smooth; area superomedia longer than wide, parallel-sided or a little narrowed in the anterior part. Black; the following are obscure ferruginous: collare, pronotal ridge, tegulae, subalarum, a V-shaped pattern on the mesoscutum (sometimes occupying the greater part of its surface), scutellum, postscutellum and more or less extensively the posterior part of propodeum.

Legs.–Moderately slender. Coxae, trochanters and femora predominantly black; trochantelli, apices of femora I and II narrowly and the frontal side of femora I extensively ferruginous; tibiae and tarsi yellowish-ferruginous; tibiae III apically blackish.

Abdomen.–Median field of postpetiolus densely striate; gastrocoeli small, shallow, with subobsolete thyridia; second tergite densely and fairly finely punctured, basally between gastrocoeli with short, longitudinal striae; third tergite very finely and rather sparsely punctured. Black; sometimes apex of postpetiolus and apical segment obscure brownish tinted (discoloration?).

Male

Black; sometimes scutellum apically obscure ferruginous; face and clypeus white; tibiae and tarsi predominantly yellow, coxae and femora predominantly black; length 13 mm.

Flagellum.—With narrow, bacilliform tyloides on segments 5-15, the longest (on about 6-12 segments) reaching almost from bases to apices of segments. Black; scape ventrally yellow.

Head.—Temple profile moderately narrowed, with curved outline, malar space somewhat shorter than width of base of mandible. Black; the following are white: mandibles except teeth, clypeus, face, frontal orbits narrowly.

Thorax.—Mesoscutum convex, finely and rather sparsely punctured; scutellum convex, distinctly raised above postscutellum; area superomedia as wide as, or somewhat wider than, long, narrowed anteriorly. Black; in one specimen scutellum apically obscure ferruginous marked; tegulae brownish.

Legs.—Coxae and trochanters black, coxae I and II ventrally yellow marked; trochantelli ferruginous; femora predominantly black or blackish-brown, femora I and II apically and ventrally pale yellowish-ferruginous; tibiae and tarsi yellowish, tarsi III apically blackish.

Abdomen.—Median field of postpetiolus and space between gastrocoeli longitudinally striate; tergites 2-5 densely punctured, nearly opaque. Uniformly black.

14. *Pseudamblyteles carbo, new species*

Types

Holotype.—♀, Maine, Dryden, 31.VII.1959, G. H. Heinrich. C.G.H.

Allotype.—♂, Maine, Dryden, 17.VII.1952, G. H. Heinrich. C.G.H.

Paratypes.—2 ♀♀, 1 ♂, Ontario, 2 ♂♂, Quebec. C.N.C. No. 7244; 1 ♀, Ontario, 9 ♂♂, Maine. C.G.H.

Distribution

Maine, Ontario, Quebec.

Preamble

A black species, with black femora III, related to *populorum*, new species, but differing by longer flagellum of female and by head structure.

Female

Black, including scutellum and femora III; wings distinctly infuscated; frontal orbits, facial orbits, or entire lateral fields of face, sometimes clypeus and cheeks partially or entirely, ferruginous; length 13-16 mm.

Flagellum.—Bristleshaped, extremely attenuated, with acute apex, ventrally distinctly flattened beyond middle but not, or scarcely, widened, with 43-46 segments, the first about 2.5 times as long as wide, the ninth or tenth approximately square. Black, with white annulus on segments 7-14 or 15 or 16, the segments before the annulus usually ventrally yellowish, sometimes all except the first segment pale ferruginous.

Head.—Temple profile strongly narrowed with straight outline, cheek profile moderately narrowed with slightly curved outline; malar space about as long as width of base of mandible; cheeks between eyes and carina genalis moderately wide, somewhat constricted at the latter; upper mandible tooth comparatively short, the lower small and scarcely separated by a gap. Black; the following

are ferruginous: frontal orbits up to vertex, facial orbits broadly, sometimes clypeus apically or entirely, sometimes mark on lower part of outer orbits or the entire cheeks.

Thorax.—Mesoscutum almost flat, finely and not densely punctured; notauli subobsolete; scutellum flat, nearly smooth and shiny; area superomedia approximately square or somewhat longer than wide, usually slightly narrowed toward apex. Black; collare, apex of pronotal ridge and tegulae black or ferruginous.

Legs.—Fairly slender. Black; tibiae ventrally more or less extensively yellowish at bases, dorsally brownish, tibiae II and III apically blackish; femora I apically or sometimes entirely and all tarsi reddish-brown, the tarsi III usually infuscated; in one specimen also femora II predominantly and the trochantelli reddish-brown.

Abdomen.—Median field of postpetiolus clearly defined, regularly longitudinally striate; gastrocoeli small and shallow, thyridia obsolete; interval of gastrocoeli with short, parallel, longitudinal striae; second tergite densely and moderately strongly, the third more finely and toward the apex more sparsely, punctured. Uniformly black.

Male

Black, scutellum usually white; in majority of specimens second tergite, sometimes also the third, rarely also the fourth, with irregular, yellow, lateral marks; femora III black, femora I and II yellow, dorsally reddish, or sometimes partially black; tibiae yellow, tibiae III apically black; length 15-19 mm.

Flagellum.—With oval tyloides on segments 8-18 or 19, the longest not reaching apices of segments. Black; scape ventrally yellow.

Head.—Temple profile moderately narrowed, slightly curved; malar space about one third shorter than width of base of mandible; occipital carina slightly raised. Black; the following are yellow: mandibles, clypeus, face, frontal orbits, usually a mark of variable shape and extent on lower part of outer orbits, and/or a mark on cheeks.

Thorax.—Mesoscutum moderately convex; scutellum somewhat convex and raised above postscutellum; area superomedia usually approximately square. Black; the following are yellow: collare, pronotal ridge apically or entirely, often the very apex of pronotal base, subalarum, tegulae, scutellum (with rare exceptions), usually small lateral marks on prosternum, often a mark on lower anterior part of mesopleura.

Legs.—Legs I and II yellow, except base of coxae, their femora dorsally usually pale rufous or sometimes partially black; femora III always black, tibiae III yellow, apically black; coxae and trochanters III black, the former sometimes apico-ventrally marked, the latter sometimes with yellow apex; trochantelli III always yellow; tarsi III usually reddish tinted.

Abdomen.—Black; in about 50% of specimens the second tergite with irregular, yellowish, lateral marks, more rarely also the third tergite with similar marks, exceptionally also the fourth.

15. *Pseudamblyteles micramoenus*, new species

Types

Holotype.—♀, Maine, Weld, 27.VI.1955, Gerd H. Heinrich. C.G.H.
Paratypes.—1 ♀, Maine, Weld; 1 ♀, Maine, Dryden. C.G.H.

Distribution

Maine.

Preamble

This small, distinct species has been found, so far, in the region of the type locality only, two out of the three known specimens on a high mountain meadow of the Mt. Blue range. Its characters leave some doubts concerning its generic position, as the structure of propodeum and abdomen differs somewhat from the bulk of typical *Pseudamblyteles* species and seems to approach *Eutanyacra* Cameron, as does also the general chromatic appearance. There is, however, but an indistinct fringe of bristles on the hypopygium, and the shape of mandibles is quite different from *Eutanyacra.* So the species may be better placed in *Pseudamblyteles* until the discovery of the male should prove differently.

Female

Ferruginous, thorax with restricted black pattern; scutellum yellowish tinted; tergites 1-3 or sometimes 4 with black, basal bands, which on the second and third tergites sometimes extend over more than half of the surface; second tergite with indistinctly yellowish apical band; legs without black pattern; flagellum tricolored; length 11 mm.

Flagellum.—Bristleshaped, moderately attenuated toward apex and acutely pointed, ventrally flattened beyond middle and slightly widened, with 38 segments, the first about 2.5 times as long as wide, about the seventh square, the widest slightly wider than long. Scape and segments 1-6 ferruginous, 7-12 or 13 with white annulus, apex black.

Head.—Temple profile moderately narrowed with curved outline, cheek profile more distinctly narrowed with nearly straight outline; malar space about as long as width of base of mandible; cheeks fairly wide between eyes and carina genalis, constricted at the latter; mandibles with small teeth, the upper not much longer than the lower and pointed. Ferruginous; supraantennal cavities black.

Thorax.—Mesoscutum slightly convex, very densely punctured, opaque, notauli obsolete; scutellum distinctly raised above postscutellum, dorsally slightly convex, distinctly punctured; carination of propodeum complete, including costulae; area superomedia receiving costulae before middle, slightly narrowed from their insertion toward base, more distinctly toward apex, about as long as wide at costulae or slightly longer; apices of areae dentiparae slightly prominent. Ferruginous; the following are black: base and apex of prosternum or its entire surface, middle of pronotum behind collare, prepectus, narrow, median line on mesosternum (or sometimes the entire mesosternum), mark on mesopleura before coxae II, small mark on upper border of mesopleura behind subalarum, mark on base of median lobe of mesoscutum (at border of pronotum), scutellar and propodeal sutures.

Legs.—Fairly slender; coxae III ventrally sparsely and finely punctured, shiny. Uniformly ferruginous; base of coxae usually narrowly black; tibiae III sometimes indistinctly yellowish tinted beyond base.

Abdomen.—Median field of postpetiolus clearly defined, finely, longitudially striate, with scattered, gross punctures at apex; gastrocoeli small but distinct, thyridia obsolete; second tergite and third (except apex) fairly strongly and very densely punctured, opaque. Ferruginous; tergites 1-3 with black, basal bands of varying extent, which sometimes occupy most of the second and third tergites; the fourth tergite sometimes with a laterally abbreviated black basal band; second tergite apically indistinctly yellowish banded.

19. Genus *Eutanyacra* Cameron

Eutanyacra Cameron, 1903, Trans. Ent. Soc. London, p. 227.
Eutanyacra Heinrich, 1956, Canad. Entom., 88:477.

Type-species.—*Eutanyacra pallidicoxis* Cameron.

The genus is based predominantly on the male sex, while females are more difficult to identify, and especially difficult to distinguish from *Pseudamblyteles* Ashmead. The main character of males is represented by a long, narrow median process of the hypopygium. This formation corresponds with the genera *Triptognathus* Wesmael and *Spilichneumon* Thomson. In the former genus, which has not been recorded from the Nearctic Zone so far, the lower mandible tooth, normally developed in *Eutanyacra*, is obsolete in both sexes. From *Spilichneumon* the males of *Eutanyacra* may be distinguished by their more abbreviated propodeum and blunter appearance of the apex of abdomen, caused by an abbreviation of the last three tergites, especially the seventh, which is usually somewhat truncate and transverse; besides in most of the American *Eutanyacra* males the hypopygial process is not quite flat as in *Spilichneumon*, but slightly compressed laterally (Fig. 31); the row of long, parallel-sided tyloides often starts on the second, or even on the first flagellar segment.

Females have a bunch, or fringe, of long, stiff bristles on the middle of the apical part of the hypopygium (Fig. 22); their flagellum is always bristleshaped and rather slender, very long attenuated and acutely pointed at apex; the abdomen comparatively stout and slightly compressed towards the apex, the propodeum rather short with subquadrate or transverse area superomedia. The combination of all the characters above permits a clear separation from *Spilichneumon*, but does not seem quite as satisfactory for distinction from *Pseudamblyteles*. In the latter genus the hypopygium is often also covered by stiff bristles, which, however, as a rule, are shorter and more evenly distributed over the whole surface. In cases of doubt the examination of the associated male will be necessary in order to confirm the generic position of a species. In most of the American species of *Eutanyacra* the upper mandibular tooth is distinctly blunted (Figs. 38, 40); not so in *Pseudamblyteles* (Figs. 35, 37).

Flagellum.—Of females always bristleshaped, very long attenuated and acutely pointed at apex, not, or little widened beyond middle, with moderately elongate to fairly stout basal segments; flagellum of males with a long row of elongate, parallel-sided tyloides, which begins usually on the first, second or third segment, and forms an almost continuous ridge (Fig. 55).

Head.—Temple and cheek profiles ranging from moderately narrowed to distinctly inflated, both on the average wider than in *Pseudamblyteles;* mandibles normal, in North American females the upper tooth usually more or less blunted (Fig. 38).

Thorax.—Mesoscutum slightly convex, or almost flat; notauli short, or obsolete; scutellum usually somewhat elevated above the postscutellum, dorsally flattened in females, convex in males; propodeum somewhat abbreviated, the area superomedia usually being wider than long, sometimes square; costulae usually weak or obsolete.

Legs.—From moderately slender to stout; coxae III never with scopa.

Abdomen.—Amblypygous, slightly compressed toward apex, comparatively stout (Figs. 20, 22); the second tergite usually shorter than apically wide, the third much wider than long; postpetiolus with clearly defined median field, which is as a rule longitudinally striate in females, often irregularly rugose in males;

gastrocoeli usually small and shallow, with subobsolete or inconspicuous thyridia; hypopygium with a fringe, or bunch, of stiff bristles at apex (Figs. 20, 22-24).

Color.—In the small *improvisa* group (3 species) the abdomen is black with white anal pattern. In this group the sexual dimorphism is inconspicuous. In the bulk of the species the abdomen of females is ferruginous, usually with black bands (*succincta* group); here the sexual dimorphism is considerable and shows a similar pattern to that in the *laetus* group of *Ichneumon*, the abdomen of males being black and yellow banded.

Biology.—All females hibernate as adults, preferring half-rotten stumps and moss. According to the few known host records, Noctuinae seem to be the favoured hosts. Eggs are deposited into the host larvae, as proven by several rearings from Noctuidae collected as caterpillars.

Distribution.—Somewhat wider than that of the genus *Pseudamblyteles*. Although the great majority of species inhabits the Temperate Zones of the Old and New Worlds, a few have invaded the Arctis and a few are found in mountainous regions of the oriental tropics. Only three species (*crispatorius* Linnaeus, *pallidicornis* Gravenhorst and *glaucatorius* Fabricius) occur in Europe, while about 15 are already known from North America.

Remarks

The numerous species of the *succincta* group show an unusual chromatic and morphologic conformity in both sexes and thus represent one of the most difficult taxonomic problems in the subfamily. Females are often moderately differentiated in structure of femora and head. But these differences are hard to describe and not always easy to recognize. I named and described only such species of which I had a rather clear conception and good series. There may be more species in existence, with almost imperceptible morphological, but perhaps good biological, differences, which further research may reveal.

After completion of the treatment of the genus *Eutanyacra* it was found that the puncturation of femora III of females is rather strongly differentiated within the genus, and may be useful as an additional character for identification of several species. Two main patterns can be distinguished, one characterized by even and dense puncturation on the entire exterior surface of coxae III (as represented for example by the species *improvisa* (Cresson), *perannulata* Hopper, *validiceps*, new species, *miraculosa*, new species, *pycnopus*, new species), the other by presence of only a few, scattered punctures on the major part of their exterior side, except near apex where puncturation turns dense on a more or less restricted area (as for example represented by *suturalis* (Say), *succinctus* (Brullé), *vilissima*, new species, *solitaria*, new species, *munifica*, new species). At present no time is left at my disposal for comprehensive investigations concerning the mentioned character. The matter is recommended to the attention of coming workers.

Key to the Species of *Eutanyacra* Cameron of Eastern North America

Females

1. Abdomen black, without ferruginous or rufous pattern (usually with white anal marks). 2
   At least one tergite, usually basic color of entire abdomen, ferruginous or rufous. 6
2. Legs predominantly red. ..... 1. *valdenigra* Heinrich (female unknown)
   Legs black. 3

3. Tibiae III uniformly black. 4
Tibiae III with white annulus or mark beyond base. (Tergites 5-7 with white anal pattern.) 5

4. First segment of flagellum scarcely twice as long as wide; temple profile not narrowed, with broadly curved outline; tergites 5 and 6 with medially widened, laterally abbreviated, white, apical bands, seventh with anal mark. (Length 13-15 mm.) ..... 2a. *improvisa improvisa* (Cresson)
First segment of flagellum more than twice as long as wide; temple profile moderately narrowed; tergites 4-7 with regular, medially not-widened, laterally less-abbreviated, white apical bands. (Length 13-14 mm.) ..... 4. *consignata* (Cresson)

5. First segment of flagellum scarcely twice as long as wide, the sixth square; temple profile not narrowed, with broadly curved outline; tibiae III dorsally white marked beyond base. (Length 14 mm.) ..... 2 b. *improvisa columbiana*, new subspecies
First segment of flagellum 2.5 times as long as wide, about the tenth square; temple profile slightly narrowed with slightly curved outline; tibiae III with white annulus beyond base. (Scutellum white or black; length 12-13 mm.) ..... 3. *perannulata* Hopper

6. Only the second tergite red. (Tergites 3-7 black with narrow, regular, white, apical bands from side to side; flagellum unusually stout and short, without annulus; length 10.5-12 mm.) ..... 5. *chillcotti* Heinrich
Basic color of entire abdomen ferruginous or red, or (in one species) abdomen black with yellow bands on tergites 1-3. 7

7. Black, tergites 1-3 with broad, yellow apical bands. (Length 11 mm.) ..... 16. *trivittata*, new species
Basic color of abdomen ferruginous or red. 8

8. Wings distinctly infuscated. 9
Wings clear or almost so. 12

9. Temples and cheeks extremely widened, in exact front view visible simultaneously on both sides around the eyes, giving the outline of the head an almost circular shape (Figs. 46, 49); femora extremely short and thick, scarcely 2.5 times as long as wide (flagellum rather short and stout; thorax black, mesoscutum and head ferruginous, scutellum yellow; length 12-13). ..... 8. *pycnopus*, new species
Temples and cheeks much less widened, in front view not visible around eyes simultaneously on both sides; femora not unusually short and wide, scarcely 3.5 times as long as wide. 10

10. Head and thorax black, except white scutellum, subalarum and lateral facial bands; flagellum black with white annulus; tergites 2-7 uniformly red; femora black. (Wings strongly infuscated; tibiae red-brown, narrowly infuscated at bases and apices; length 16 mm.) ..... 7. *miraculosa*, new species
Head, mesoscutum and scutellum predominantly ferruginous; flagellum tricolored or without annulus; abdomen ferruginous, usually with some black basal bands on anterior tergites; legs ferruginous. 11

11. Wings strongly infuscated; flagellum tricolored; pleura and sterna extensively or entirely black. (Length 13-14 mm.) ..... 6. *succincta* (Brullé)
Wings but slightly infuscated; flagellum without white annulus, ferruginous with dark apex; pleura and sterna extensively ferruginous. (Length 11-14 mm.) ..... 10. *suturalis* (Say)

12. Sterna, pleura and usually coxae black. (Scutellum yellow.) 13
Sterna, pleura and coxae predominantly or entirely ferruginous. 15

13. Temples and cheeks extremely widened, visible behind eyes in front view simultaneously on both sides for their whole length. 9
Temples and cheeks less widened, in front view not visible simultaneously on both sides for their whole length. 14

14. Femora black; flagellum very stout, third flagellar segment but little longer than apically wide; tergites 2-7 uniformly red-brown without any black or infuscated bands, except sometimes base of second tergite; length 14-16 mm. (Mesoscutum usually entirely black, sometimes with indistinct brownish marks.) ..... 9. *hiemans*, new species
Femora ferruginous; flagellum less stout, third flagellar segment on the average distinctly longer, about 1.2-1.5 times as long as wide; tergites 1-4 with more or less extensive black basal bands; length 12-14 mm. (Mesoscutum mutating from red to black, more often entirely red than entirely black; flagellum always with annulus.) ..... 11 a. *vilissima vilissima*, new subspecies

15. Flagellum without white annulus, ferruginous or brownish, blackish toward apex; scutellum never white or yellow. (Length 11-14 mm.) ..... 10. *suturalis* (Say)
Flagellum with distinct white annulus; scutellum often white or yellow. 16

16. Apex of femora III and tibiae III black. (Temples and cheeks strongly inflated, head in front view almost rectangular; length 10.5 mm.) ..... 13. *validiceps*, new species
Femora III and tibiae III uniformly ferruginous. 17

17. Femora very short and thick (Fig. 36); cheeks and temples very wide; upper mandibular tooth broadly blunted, nearly shovel-shaped (Fig. 40). (Scutellum yellow; first and second tergites not seldom with irregular, pale-yellowish marks; length 14-16 mm.) ..... 14. *munifica* (Cresson)
Femora moderately stout (Fig. 34); cheeks and temples less wide; upper mandibular tooth normally blunted (Fig. 38). 18

18. Large species, 14-16 mm. long; flagellum long, with 44-47 segments. (Scutellum ferruginous like the rest; temple and cheek profiles moderately narrowed; femora moderately slender.) ..... 15. *saguenayensis* (Provancher)
Smaller species, 11-15 mm. long; flagellum shorter, with 37-42 segments. 19

19. Scutellum clearly pale yellow; temples wider than in the alternative species, slightly inflated; length 13-15 mm. ..... 12. *solitaria*, new species
Scutellum ferruginous like the rest, rarely yellowish tinted; temple profile slightly narrowed, not inflated; length 11-14 mm. ..... 11 b. *vilissima rubricosa*, new subspecies

Males

1. Abdomen black, all but one species with white anal pattern. 2
Abdomen at least partially yellow, ferruginous or orange, without white anal pattern. 5

2. Femora red; flagellum without annulus; abdomen without white anal pattern; tibiae III red with black apex. (Length 16 mm.) ..... 1. *valdenigra* Heinrich
Femora black; flagellum with white annulus; abdomen with white anal pattern; tibiae III black with white annulus or semiannulus. 3

3. Tergites 3 or 4 to 7 with laterally abbreviated, medially not-widened, white apical bands, the second, sometimes also the third, tergite with irregular white lateral marks; mesoscutum usually with two short, white, median lines. (Length 13 mm.) ..... 4. *consignata* (Cresson)
Only tergites 5-7 or 6 and 7 with white pattern; mesoscutum medially not white marked. 4

4. Tibiae III with white dorsal stripe beyond base; tergites 5-6 with white apical bands, the seventh with white anal mark; all segments of tarsi II white with infuscated apices and partially infuscated ventral side; length 14-19 mm. ..... 2. *improvisa* (Cresson)
Tibiae III with full, white annulus beyond base; fifth tergite without white pattern, only the sixth and seventh (or seventh) with white anal marks; first segment only of tarsi II white with dark apex, the following segments blackish; length 14-15 mm. ..... 3. *peranmulata* Hopper

5. Tergites 2 and 3 red, 4-7 black with narrow, regular, white apical bands, which are laterally not abbreviated. (Length 12 mm.) ..... 5. *chillcotti* Heinrich
Basic color of entire abdomen red or ferruginous, or anterior tergites with broad, apical, yellow bands; apical tergites never with white apical bands. 6

6. Flagellum with light annulus, or with pale yellow basal half and dark apex. (Basic color of abdomen ferruginous.) 7
Flagellum black, or sometimes predominantly ferruginous, without annulus. 9

7. Femora III extremely short and thick, entirely black or infuscated; temples strongly inflated, temple profile widened instead of narrowed; about 12 basal segments of flagellum pale yellow, apex black; pleura, sterna and propodeum black. (Abdomen ferruginous with black pattern on tergites 3 and 4; length 12-15 mm.) ..... 8. *pycnopus*, new species
Femora III normal, predominantly or entirely ferruginous; temple profile not widened; flagellum with white annulus; pleura, sterna and propodeum extensively ferruginous or yellow. 8

8. Pleura, propodeum, anterior tergites, coxae, trochanters and tibiae extensively yellow marked. (Length 15 mm.) ..... 12. *solitaria*, new species (tentatively associated)

Pleura, propodeum, anterior tergites, coxae, trochanters and tibiae ferruginous without yellow markings. (Apex of femora and tibiae III black; tergites 2-4 with black basal bands; length 12 mm.) ..... 13. *validiceps*, new species

9. Wings strongly infuscated. (Thorax except scutellum, all coxae entirely and femora predominantly, black; length 14-16 mm.) ..... 6. *succincta* (Brullé)
Wings clear, or sometimes slightly infuscated. 10

10. No yellow pattern on thorax (except scutellum) and abdomen. (Abdomen ferruginous with more or less extensive black basal bands on tergites 1-5 or 6; length 14-16 mm.) ..... 10. *suturalis* (Say) variety
Thorax with yellow pattern, tergites 1-3 or 4 with yellow apical bands. 11

11. Large species, 18-20 mm. long. 12
Smaller species, 12-16 mm. long. 13

12. Abdomen fairly slender; the second tergite distinctly longer than apically wide, the third about 1.5 times as wide as long; temple profile and scutellum apically more narrowed than in the alternative species. (Tergites 2-4 sometimes orange tinted between black bases and yellow apices). ..... 15. *saguenayensis* (Provancher)
Abdomen comparatively wider, the second tergite about as long as wide, the third nearly twice as wide as long; temple profile wider, scarcely narrowed; scutellum normally convex, apically not narrowed. ..... 14. *munifica* (Cresson)

13. Tergites 1-3 black with broad, clear lemon-yellow, apical bands, the following tergites black, the fourth usually with narrow, latero-apical marks; hypopygial process shorter than in the alternative species. (Propodeum yellow marked; mesopleura and femora black; length 13 mm.) ..... 16. *trivittata*, new species
Tergites 1-4 basally black with broad, lemon-yellow apical bands, or anterior tergites partially orange tinted. 14

14. Thorax black with clear, lemon-yellow pattern; tergites 1-4 clear, lemon-yellow with narrow, black, basal bands; propodeum and often mesopleura lemon-yellow marked; no ferruginous or orange pattern. (Length 13-16 mm.) ..... 11. *vilissima*, new species
Thorax with more or less extensive ferruginous pattern; anterior tergites basally black, medially ferruginous or orange tinted, apically yellowish; propodeum and usually mesopleura ferruginous or ferruginous and yellow marked. (Length 14-16 mm.) ..... 10. *suturalis* (Say)

1. *Eutanyacra valdenigra* Heinrich

Eutanyacra valdenigra Heinrich, 1958, Canad. Entom., 90:740, ♂.

Types

Holotype.– ♂, Quebec, Payne Bay, 11.VII.1958, W. R. M. Mason. C.N.C. No. 6778.

Distribution

Arctic Quebec.

Male

Uniformly black including head, thorax, abdomen, coxae, trochanters and antennae, except for a white vertical band on each side of the face, which is widened somewhat towards the clypeal foxeae; legs red, apex of tibiae III, apex of metatarsus III and following segments of tarsi III blackish; length 16 mm.

Flagellum.–With 36-38 segments, with elongate-oval, comparatively wide tyloides on segments 2-18 or 19, which on segments 3-15 almost, but not quite, reach from end to end of segments; first segment in ventral view about 1.5 times as long as wide, thus being distinctly longer than in *chillcotti* Heinrich. Uniformly black including scape.

Thorax.–Mesoscutum distinctly, scutellum strongly convex, both fairly strongly but not densely punctured, shiny; notauli obsolete; area superomedia transverse. Uniformly black.

Wings.—Clear; stigma deep black.

Abdomen.—Median field of postpetiolus distinctly longitudinally striate; gastrocoeli slightly deepened, thyridia visible; hypopygial process well developed, distinctly longer than in *chillcotti.*

2. *Eutanyacra improvisa* (Cresson)

Distribution

Transcontinental in Transition Zone. Populations from British Columbia differ slightly from eastern populations in color of legs.

Preamble

The three species *improvisa* Cresson, *consignata* Cresson and *perannulata* Hopper form a chromatic group differing from the bulk of other species by black basic color of legs and abdomen, with white pattern on the abdomen only, or on the legs as well. *Eutanyacra improvisa* is distinguished from the other two species by its stouter basal flagellar segments and by its wider, inflated temples.

Female

Black, scutellum white; tergites 5-7 with white anal pattern; legs including tibiae uniformly black in the eastern subspecies, tibiae white marked in the western; temples broadly curved; length 13-15 mm.

Flagellum.—Bristleshaped, very long attenuated toward apex and acutely pointed, not widened beyond middle, with comparatively stout basal segments, composed by 39-42 segments, the first scarcely twice as long as wide, the sixth square. Black with white annulus on segments 5 or 6 to 11, 12 or 13.

Head.—Temple profile not, cheek profile comparatively little, narrowed, the former with broadly curved, the latter with nearly straight outline; temples and cheeks slightly inflated; upper mandibular tooth apically blunted. Uniformly black.

Thorax.—Mesoscutum nearly flat, notauli slightly indicated at base; scutellum slightly convex; area superomedia square, sometimes wider than long, costulae obsolete. Black, scutellum white. In western subspecies subalarum white.

Legs.—Moderately stout; femora and tarsi a little stouter than in the other species of the group. Uniformly black in the eastern subspecies, tibiae white marked in subspecies *columbianus.*

Abdomen.—Median field of postpetiolus more or less distinctly longitudinally striate; gastrocoeli shallow, thyridia usually obsolete, sometimes narrow thyridia visible; second and third tergites densely and fairly strongly punctured, subopaque. Black, fifth and sixth tergites medially with white apical band, the seventh with white apical mark.

Male

Black, scutellum, subalarum and tegulae white; flagellum with annulus; tergites 5 and 6 with white apical band, the seventh tergite with white anal mark; tibiae and tarsi I and II predominantly white, tibiae III with white dorsal stripe beyond base; sometimes second tergite with white lateral marks; length 14-19 mm.

Flagellum.—With long, beam-shaped, parallel-sided tyloides on segments 2 or 3 to 15 or 16, which, except the first and last two, reach from bases to apices of segments, forming a continuous ridge. White annulus on segments 7 or 8 to 12, 13 or 14; scape ventrally white.

Head.—Black; lower part of frontal orbits and face and clypeus white, except a longitudinal, median black band; rarely white mark on lower part of outer orbits.

Thorax.—Mesoscutum opaque; scutellum fairly strongly convex; area superomedia transverse. Black; the following are white: subalarum, pronotal ridge predominantly, scutellum, rarely mark on collare.

Legs.—Black; the following are white: dorsal stripe on tibiae III from slightly beyond base to about middle, usually dorsal stripe on basal part of metatarsus III, tibiae I and II except black wedge-shaped stripe on ventral side toward apex, tarsi I and II except narrow apices of segments, apical marks on inner side of femora I and II, often inner side of femora I more extensively.

Abdomen.—In contrast to the female, the median field of postpetiolus is more often irregularly rugose rather than longitudinally striate. Black; second tergite rarely with two white lateral marks, tergites 5 and 6 with white apical bands, the seventh tergite with white apical mark; rarely apical band on fifth tergite absent.

2 a. *Eutanyacra improvisa improvisa* (Cresson)

Ichneumon improvisus Cresson, 1867, Amer. Ent. Soc. Trans., 1:296, ♂.
Amblyteles tetricus Provancher, 1877, Nat. Canad., 9:10, ♂ ♀.
Amblyteles improvisus Townes, 1951, Synoptic Catalog, p. 294.

Types

Holotypes.—Ichneumon improvisus Cresson, ♂, New Jersey. A.N.S. *Amblyteles tetricus* Provancher, ♀. Quebec. Provincial Museum, Quebec.

Hosts

One male labeled "ex *A. perqui*" from Quebec, evidently bred from *Anomogyna perquivitata* Morr. (C.N.C.). *Ceramica picta* Harr. (Hadeninae) (C.N.C.).

Distribution

According to H. Townes 1951: "Nova Scotia, Quebec, New York, New Jersey, Alberta". New records: Maine (C.G.H.); Ontario, Saskatchewan (C.N.C.).

Female

Tibiae II and III and subalarum black; length 13-15 mm.

2 b. *Eutanyacra improvisa columbiana*, new subspecies

Types

Holotype.—♀, British Columbia, Robson, 1947, H. R. Foxlee. C.N.C. No. 7202.

Paratype.—♀, British Columbia, Cheakamus, 10.X.1917, W. B. Anderson. C.N.C.

Distribution

British Columbia.

Female

All tibiae white marked beyond base; subalarum white; length 14 mm.

Male

The single specimen from British Columbia (Vernon) in the C.N.C. has no white apical band on the fifth tergite and agrees otherwise with *improvisa improvisa;* as in the latter subspecies specimens without white pattern on the fifth tergite exceptionally also occur, it remains uncertain whether or not the lack of this pattern is a constant character of the males of *improvisa columbiana.*

3. *Eutanyacra perannulata* (Hopper)

Amblyteles perannulatus Hopper, 1938, Amer. Ent. Soc. Trans., 64:98, ♀.
Amblyteles perannulatus Townes, 1951, Syn. Cat., p. 295, ♀.
Eutanyacra perannulata Heinrich, 1959, Ent. News, 70:210, ♀.

Types

Holotype.– ♀, Pennsylvania, Philadelphia. A.N.S.
Neallotype.– ♂, Maine, Dryden. C.G.H.

Distribution

According to H. Townes, 1951: "Transcontinental in Transition Zone".

Preamble

Females of this species are distinguished by their white annulated tibiae and slender flagellum. The western *improvisa columbiana*, new subspecies, which also has white marked tibiae, can be mistaken for this species, but differs distinctly by stouter basal flagellar segments and much wider, strongly curved temples. Males are similar to *improvisa* (Cresson). They differ by the fifth tergite being always entirely black, by their much narrower tyloides and by the sculpture of fourth tergite which is finer and less dense than in *improvisa*.

Female

Black, scutellum white, in specimens from Maine and Quebec black; all tibiae with white annulus; tergites 5 and 6 with white, laterally-abbreviated, median, apical bands, the seventh with white apical mark; first segment of flagellum 2.5 times as long as wide; length 12-13 mm.

Flagellum.–Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally flattened but not at all widened beyond middle, with 41-42 segments, the basal segments being elongate, the first about 2.5 times as long as wide, the tenth approximately square. Black with white annulus on segments 5 or 6 to 13 or 14.

Head.–Temple profile slightly narrowed, with slightly curved outline; cheek profile distinctly narrowed with straight outline; upper mandibular tooth blunted. Black.

Thorax.–Mesoscutum slightly convex, densely punctured; notauli basally fairly distinct; scutellum convex; area superomedia approximately square; costulae obsolete. Black; scutellum white in the type, usually black in northern specimens.

Legs.–Tarsi and femora more slender than in *improvisa*. Black with white pattern; the following are white: annulus on tibiae II and III, tibiae I predominantly, apical mark on interior side of femora I.

Abdomen.–Median field of postpetiolus irregularly rugose or longitudinally striate; gastrocoeli shallow, thyridia fairly distinct; second and third tergites densely and fairly strongly punctured. Black; apices of tergites 5 and 6 with laterally abbreviated white median bands, the seventh with white anal mark.

Male

Rather similar to *improvisa* but distinguishable by the combination of the following slight differences: tyloides more slender, bacilliform rather than beam-shaped; temple profile more narrowed; first flagellar segments more slender and elongate; tibiae III not with white dorsal stripe beyond base, but with full white annulus, covering the ventral side as well; fifth tergite always without white anal

band, the sixth with white anal mark instead of an anal band, or entirely black too.

Black, scutellum and subalarum white; flagellum with annulus; tergites 6 and 7, or the seventh only, with white anal mark; tibiae and tarsi I predominantly white, tibiae II and tibiae III with full, white annulus beyond base; length 14-15 mm.

Flagellum.—With long, bacilliform tyloides on segments 3-15 or 16, which, except the first and the last two, reach from bases to apices of segments, forming a continuous ridge. White annulus on segments 6 or 7 to 13 or 14; scape ventrally white marked at apex.

Head.—Temple profile more narrowed than in *improvisa*. Black; lowest part of frontal orbits and face and clypeus white, except a longitudinal, median, black band.

Thorax.—Mesoscutum almost opaque; scutellum fairly strongly convex; area superomedia slightly wider than long. Black; the following are white: subalarum, apex of pronotal ridge, mark on anterior end of tegulae and scutellum.

Legs.—Black; the following are white: full annulus on tibiae II and III beyond base, tibiae I except wedge-shaped stripe on ventral side toward apex, segments 1, 2 and 5 of tarsi I and segment 1 of tarsi II except apices, apical marks on inner side of femora I and II.

Abdomen.—Median field of postpetiolus more often irregularly rugose rather than longitudinally striate; fourth tergite more finely and sparsely punctured than in *improvisa*. Black; seventh tergite with white, apical mark; fifth tergite without, the sixth with, or without, white, apical pattern; if white pattern on sixth tergite present, it has the shape of a mark rather than of a band, as in *improvisa*.

4. *Eutanyacra consignata* (Cresson)

Ichneumon consignatus Cresson, 1867, Amer. Ent. Soc. Trans., 1:298, ♂.
Amblyteles consignatus Townes, 1951, Syn. Cat., p. 294, ♂.

Types

Holotype.—♂, Virginia. A.N.S.

Neallotype.—♀, West Virginia, Bolivar. C.H.T.

Distribution

According to H. Townes 1951: "Massachusetts, New Jersey, Maryland, West Virginia, Ohio." New record: Ontario, Honey Harbor (C.N.C.).

Preamble

The female of this species shares the uniformly black color of tibiae III with *improvisa improvisa* (Cresson) but comes closer to *perannulata* (Hopper) in structure of head and flagellum; the white anal pattern is somewhat different from both species mentioned. The male is well distinguished by displaying a white pattern on all segments, except the first and sometimes the third.

Male

Black; scutellum, subalarum, tegulae and usually two short median lines on mesoscutum white; flagellum with annulus; second and usually third tergite with irregular, white, lateral marks, third or fourth to seventh tergites with white, apical bands; tibiae and tarsi I and II, basal half of tibiae III and metatarsus III dorsally white; length 13 mm.

Flagellum.—(Type specimen.) With narrow, bacilliform tyloides on segments 4-15, which on segments 9-14 reach from bases to apices of segments, forming a continuous ridge. Black with white annulus on segments 7-14; scape ventrally white.

Head.—Black; the following are white: face, clypeus (except middle), frontal orbits, marks on vertical orbits, apex of cheeks.

Thorax.—Area superomedia transverse, almost twice as wide as long. Black; the following are white: collare, subalarum, pronotal ridge, tegulae, two short, median lines on mesoscutum; sometimes mark on propleura or anterior lateral marks on mesoscutum.

Legs.—Black; the following are white: tibiae I and II and basal half of tibiae III dorsally, tarsi I and II and metatarsus III dorsally.

Abdomen.—Black; the following are white: apical bands on tergites 3-7 (gradually becoming wider from tergite to tergite toward apex of abdomen), irregular, lateral marks usually on segments 2 and 3, sometimes on second tergite only.

Female

Black, scutellum white; tergites 4-7 with regular, fairly narrow, white anal bands; legs including tibiae uniformly black; temple profile more narrowed than in improvisa; *length 13-14 mm.*

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally flattened but not widened beyond middle, with 39-40 segments, the first more than twice as long as wide, about the eighth square. Black, with white annulus on segments 6-11.

Head.—Temple profile and cheek profile moderately narrowed, with curved outlines. Black.

Thorax.—Mesoscutum slightly convex, fairly densely punctured, somewhat shiny; notauli basally indicated; scutellum somewhat raised above postscutellum and moderately convex; area superomedia about as long as wide, narrowed toward apex; costulae obsolete. Black; scutellum and sometimes subalarum white.

Legs.—Moderately stout, femora slightly more slender than in *improvisa.* Black; tibia I and apex of femora I ivory on anterior side.

Abdomen.—Median field of postpetiolus more or less distinctly longitudinally striate; gastrocoeli slightly impressed; second and third tergites fairly strongly and densely punctured, but not quite as densely and strongly as in *improvisa.* Black; tergites 4-7 with regular, white, apical bands, which are laterally less abbreviated than in *improvisa.*

5. *Eutanyacra chillcotti* Heinrich

Eutanyacra chillcotti Heinrich, 1956, Canad. Entom., 88:478, ♀ ♂.
Eutanyacra chillcotti Heinrich, 1958, Canad. Entom., 90:741, ♀.

Types

Holotype.—♀, Northwest Territories, Salmita Mines, 4.VII.1953, J. G. Chillcott. C.N.C. No. 6395.

Allotype.—♂, Baffin Island, Frobisher Bay, 10.VII.1948, T. N. Freeman. C.N.C.

Distribution

Northwest Territories; Baffin Island; Quebec, Payne Bay.

Preamble

A striking species with tricolored abdomen and extremely stout femora and flagellum.

Female

Head and thorax black with restricted white pattern; scutellum and sometimes two short median lines on mesoscutum white; abdomen black; second tergite red, tergites 3-7 with regular white apical bands; legs red with black coxae, trochanters and femora II and III; coxae II and III dorsally white marked; flagellum entirely black, sometimes segments 7-9 dorsally white marked; length 10.5-12 mm.

Flagellum.—Short and stout, bristleshaped, considerably attenuated toward apex, slightly widened beyond middle, with 37-38 segments, the basal segments extremely short, the first scarcely longer than wide, the second a trifle wider than long. Uniformly black; in the specimen from Quebec, segments 7-9 dorsally white marked.

Head.—Temple profile not at all, cheek profile scarcely narrowed, the former with broadly rounded, the latter with slightly curved outline; cheeks and temples inflated; malar space as long as the width of base of mandible; upper mandibular tooth little longer than the lower and not distinctly blunted. Black; vertical orbits with small white mark.

Thorax.—Mesoscutum and scutellum flat and shiny, the former very finely and not densely punctured; notauli obsolete; propodeum abbreviated, the declivity almost twice as long as the horizontal part medially; area superomedia somewhat wider than long. Black; scutellum, pronotal ridge and subalarum white; in the type mesoscutum with two short, convergent, white median stripes and with a short, white lateral line on each side near tegula.

Legs.—Short and extremely stout; femora III only 2.65 times longer than medially wide. Coxae, trochanters, trochantelli and femora II and III black; femora I, all tibiae and tarsi rufous; apices of tibiae II and III and of all segments of tarsi II and III narrowly infuscated; coxae II and III dorsally white marked.

Abdomen.—Short; postpetiolus rather wide, with distinct median field, the latter more or less distinctly longitudinally striate with a few scattered punctures; gastrocoeli shallow, somewhat wider than long, with narrow thyridia; second tergite fairly densely and strongly, the third very finely and sparsely, punctured, and shiny. Black; second tergite, sides of third and the second and third sternites vivid orange-red; tergites 3-7 with regular white apical bands reaching from side to side.

Male

Head and thorax black without white pattern, except the white scutellum and subalarum and an indistinct, short line on pronotal ridge; abdomen black, segments 2 and 3 uniformly orange-red, 4-7 with regular, white apical bands; legs as in the female, infuscation on apices of hind tibiae and tarsal segments, however, obsolete; length 12 mm.

Flagellum.—With long, parallel-sided tyloides on segments 1-13, which reach from bases to apices of segments forming a continuous ridge. Black, including scape.

Thorax.—Scutellum moderately convex; area superomedia wider than long.

Legs.—Legs, especially tarsi, considerably more slender than in the female.

Abdomen.—Median process of hypopygium comparatively short, but acute.

6. *Eutanyacra succincta* (Brullé)

Ichneumon succinctus Brullé, 1846, Hist. Nat. Ins. Hym., v. 4, p. 301, ♂.
Ichneumon sandix Cresson, 1864, Ent. Soc. Phila. Proc., 3:174, ♀.
Pseudamblyteles succinctus Townes, 1951, Synopt. Cat., p. 294, ♂ ♀.

Types

Holotypes.—*Ichneumon succinctus* Brullé, ♂, "Bastard, Am. du Nord", Musée National D'Histoire Naturelle, Paris. *Ichneumon sandix* Cresson, ♀, New York. A.N.S.

Host

According to H. Townes 1951: "*Amathes c-nigrum* (L.)".

Distribution

According to H. Townes 1951: "Atlantic to 100° W. in Transition and Upper Austral Zones".

Female

Wings strongly infuscated; ferruginous including scutellum; pleura, sterna and coxae predominantly black; one, or some of the anterior tergites often with black basal bands; length 13-14 mm.

Flagellum.—Bristleshaped, very long attenuated at apex and acutely pointed, not widened beyond middle, with 42-43 segments, the first about twice as long as wide, the ninth or tenth approximately square. Scape and segments 1-5 or 6 ferruginous, the following 6-9 segments yellowish white, the apex fuscous.

Head.—Temple and cheek profile moderately narrowed, the former with slightly curved, the latter with nearly straight outline; malar space scarcely longer than width of base of mandible; upper mandibular tooth blunted. Uniformly ferruginous.

Thorax.—Mesoscutum scarcely convex, fairly densely punctured; notauli obsolete; scutellum distinctly raised above postscutellum, dorsally flattened; area superomedia wider than long, usually narrowed toward apex; costulae sometimes distinct. Ferruginous, including scutellum; the following are black: pronotum (except its upper part and pronotal base), mesopleura (usually except a ferruginous mark medially in the anterior part), metapleura including carinal triangle and areae coxales (sometimes areae metapleurales partially ferruginous), prosternum, mesosternum and prepectus.

Legs.—Moderately long and slender. Ferruginous; coxae and partially trochanters black.

Abdomen.—Median field of postpetiolus sharply defined, longitudinally striate; gastrocoeli distinctly impressed with narrow thyridia; second tergite densely and fairly strongly rugosely punctured between gastrocoeli, the third a little more finely, the fourth very finely and less densely, punctured. Ferruginous, the third tergite usually with black basal band.

Male

Wings strongly infuscated; thorax black, scutellum yellow; abdomen ferruginous, tergites 1-4 or 5 usually with black basal bands; tibiae and tarsi yellowish, coxae, trochanters and femora predominantly black; flagellum without annulus; length 14-16 mm.

Flagellum.—With long, nearly parallel-sided tyloides on segments 2-28 or 31, Black, sometimes ventrally brownish; scape ventrally yellow.

Head.–Black; the following are yellow: mandibles except teeth, clypeus, face, orbits around eyes, always interrupted on malar space, sometimes narrowly interrupted on vertex, in vertical and temple region usually ferruginous tinted.

Thorax.–Scutellum rather strongly convex; area superomedia strongly transverse, costulae distinct. Black; scutellum and partially tegulae yellow; apex of pronotal ridge often narrowly ferruginous.

Legs.–Black; apices of femora narrowly, interior side of femora I and II more or less extensively and all tibiae and tarsi yellowish.

Abdomen.–Hypopygial process long, apically rounded, flat. Ferruginous, usually with black basal bands on tergites 1-4 or 5, sometimes first tergite black except apex, rarely abdomen uniformly ferruginous.

7. *Eutanyacra miraculosa*, new species

Types

Holotype.– ♀, Maine, Dryden, 30.VII.1959. C.G.H.

Distribution

Maine.

Preamble

A distinct, but evidently extremely rare species. During 9 years of collecting at the type locality only one specimen has been procured (caught in a Malaise trap). No other specimen was found in any of the examined collections.

Female

Wings strongly infuscated; head and thorax black, except a white, longitudinal line on each side of the face, the subalarum and the scutellum; first segment black, rest of abdomen uniformly red; legs predominantly black, all tibiae pale red-brown, narrowly infuscated at bases and apices; upper mandible tooth blunted; length 16 mm.

Flagellum.–Bristleshaped, very long attenuated toward apex and acutely pointed, not widened beyond middle, with 43 segments, the first nearly 3 times as long as wide, the tenth approximately square. Black with white annulus on segments 7-11.

Head.–Temple and cheek profiles moderately narrowed, the former with curved, the latter with straight outline; malar space scarcely as long as the width of base of mandible; upper mandibular tooth blunted. Black; there is a white, longitudinal band on each side of the face, which starts at level of antennal sockets on the facial orbits, then diverges from the latter toward the clypeal foveae and ends at level of lower end of eyes.

Thorax.–Mesoscutum scarcely convex, densely punctured; notauli subobsolete; scutellum distinctly raised above postscutellum, dorsally flattened; area superomedia about as wide as long; costulae obsolete. Black; subalarum and scutellum (except base) white.

Legs.–Moderately long, femora (particularly femora I and II) stouter than in *succincta* (Brullé). Black including coxae and all trochanters and trochantelli, the tibiae pale reddish-brown (tibiae I and II slightly yellowish tinted), their bases and apices narrowly blackish infuscated; all tarsi infuscated, tarsi II and III blackish.

Abdomen.—Median field of postpetiolus well defined, longitudinally striate; gastrocoeli small and very superficial, thyridia obsolete; second and third tergites distinctly and very densely punctured, almost opaque; very distinct fringe of bristles on apex of hypopygium. Red; first segment black.

8. *Eutanyacra pycnopus*, new species

Figs. 46, 49

Types

Holotype.— ♀, District of Columbia, Washington, 3.X.1943. C.H.T.

Allotype.— ♂, Arkansas, Washington Co., 24.IX.1955. U.S.N.M.

Paratypes.—1 ♀, Ohio, Fairfield Co.; 1 ♀, District of Columbia, 1 ♂, Arkansas. C.G.H. 3 ♂♂, Arkansas, Washington Co. U.S.N.M. 1 ♂, Ontario, Port Colborne. C.N.C. No. 7249.

Distribution

District of Columbia, Arkansas, Ohio, Ontario (types and paratypes). Iowa (U.S.N.M.)

Preamble

A striking species, distinguished from all other species of the genus by its very stout legs with extremely short and thick femora and by its extremely widened temples and cheeks. Little sexual dimorphism; association of sexes therefore obvious.

Female

Wings moderately infuscated; head, mesoscutum and abdomen ferruginous, scutellum and subalarum yellow; tergites 1, 3 and 4 basally infuscated; femora III black; flagellum tricolored; length 12-13 mm.

Flagellum.—Bristleshaped, fairly short, considerably attenuated and acutely pointed at apex, ventrally flattened beyond middle but not widened, the first segment fully twice as long as wide, the eighth square. Tricolored, with white annulus on segments 5-10 or 11, the base before annulus and the scape ferruginous, apex black.

Head.—Temple profile not narrowed, but strongly widened, with curved outline (Fig. 49); cheek profile extremely wide with gradually rounded outline; in front view, cheeks are visible behind eyes on both sides simultaneously for their full length up to vertex (Fig. 46); cheeks very wide between eyes and carina genalis, scarcely constricted at the latter; malar space little more than half as long as width of base of mandible; upper mandibular tooth blunted. Ferruginous.

Thorax.—Mesoscutum slightly convex, finely and very densely punctured; notauli basally fairly distinct; scutellum somewhat raised above postscutellum and evenly convex; propodeum fairly short, the horizontal part medially little longer than half of the declivity; area superomedia about as wide as long; costulae obsolete. Mesoscutum, collare, pronotal ridge and tegulae ferruginous; subalarum and scutellum yellow; rest black.

Legs.—Very stout, femora extremely short and thick. Coxae, trochanters, femora III entirely, femora II partially black; rest ferruginous; tibiae III apically narrowly infuscated.

Abdomen.—Postpetiolus finely longitudinally striate with some scattered, gross punctures at apex; gastrocoeli small and superficial, thyridia obsolete; sec-

ond and third tergite distinctly and densely, the fourth finely and less densely, punctured. Ferruginous; petiolus and bases of third and fourth tergites more or less extensively infuscated.

Male

Somewhat more melanistic than female, otherwise scarcely differentiated.

Wings moderately infuscated; head predominantly ferruginous; mesoscutum varying from ferruginous to black; scutellum and subalarum yellow; basal infuscation on segments 1, 3 and 4 on the average more extensive than in female, sometimes replacing the basic ferruginous color entirely; usually the fifth tergite basally infuscated too; flagellum pale yellow with black apex; length 12-15 mm.

Flagellum.—With 35-37 segments and with long, fairly wide tyloides on segments 1 or 2 to 15 or 16, most of them reaching from bases to apices of segments. Segments 1-12 pale yellow, the following black, the first segment usually blackish marked; scape ferruginous, ventrally yellowish.

Head.—Shaped nearly as in female. Ferruginous; supraantennal cavities and usually middle of frons and the ocellar region black; face entirely, or except middle, and usually clypeus except middle, yellow.

Thorax.—Mesoscutum varying from entirely ferruginous as in female to entirely black; the following are yellow: apex of pronotal ridge, scutellum and subalarum.

Legs.—Femora III almost as stout as in female, femora I and II considerably more slender. Tibiae extensively yellowish tinted, femora I and II pale ferruginous; otherwise as in female.

Abdomen.—Ferruginous; first segment usually entirely black; the rest as in female; sometimes third and fourth tergite more extensively or even entirely black; sometimes basic color of second tergite partially yellowish tinted; sometimes the fifth tergite basally infuscated too.

9. *Eutanyacra hiemans*, new species

Types

Holotype.—♀, Maine, Dryden, hibernating, Gerd H. Heinrich. C.G.H.

Paratypes.—6 ♀♀, Maine, Dryden, hibernating; 1 ♀, Quebec, Gatineau, hibernating. C.G.H.; 3 ♀♀, Ontario, Constance Bay, hibernating, G. H. Heinrich; 2 ♀♀, Pennsylvania, MacKean Co., hibernating. C.N.C. No. 7207.

Distribution

Maine, Ontario, Quebec, Pennsylvania.

Preamble

A robust species, well distinguished by its stout basal segments of flagellum, black femora, uniformly red-brown abdomen and comparatively narrow temples.

Female

Head and thorax black, the former partially obscure ferruginous, scutellum white; femora and coxae black, tibiae and tarsi red-brown, tibiae II and III apically black; abdomen red-brown, petiolus more or less extensively black; flagellum robust, comparatively short; length 13-15 mm.

Flagellum.—Bristleshaped, long attenuated toward apex and acutely pointed, scarcely widened beyond middle, with 37-39 segments, the first 1.3 times as long

as wide, the fourth or fifth square. Black with white annulus on segments 4 or 5 to 12, the basal segments apically and ventrally more extensively brownish.

Head.—Temple and cheek profiles distinctly, though not strongly, narrowed, the former with slightly curved, the latter with straight outline; malar space about as long as width of base of mandible; upper mandibular tooth blunted. Black; orbits around eyes (except lower apex or at least malar space), median and lateral fields of face partially or predominantly or entirely, and clypeus predominantly dark ferruginous; rarely frontal orbits partially yellowish tinted.

Thorax.—Mesoscutum and scutellum nearly flat, the latter slightly elevated above postscutellum; notauli obsolete; area superomedia square, sometimes wider than long. Black, scutellum white; apex of pronotal ridge usually more or less extensively, sometimes tegulae and/or subalarum, dark ferruginous.

Legs.—Moderately stout; coxae, trochanters and femora black; trochantelli, tibiae and tarsi red-brown; tibiae II and III apically black; segments of tarsi II and III apically infuscated.

Abdomen.—Median field of postpetiolus: sharply defined, longitudinally striate; gastrocoeli shallow, thyridia very narrow or subobsolete; second tergite fairly densely and strongly, the third finely and toward the apex very finely and sparsely punctured. Uniformly red-brown, petiolus more or less extensively black.

10. *Eutanyacra suturalis* (Say)

Ichneumon suturalis Say, 1836, Boston Jour. Nat. Hist., 1:226, ♀.
Ichneumon grotei Cresson, 1864, Ent. Soc. Phila. Proc., 3:154, ♂.
Ichneumon propinquus Cresson, 1864, Ent. Soc. Phila. Proc., 3:174, ♀.
Pseudamblyteles grotei Townes, 1951, Synoptic Catalog, p. 294, ♂.
Pseudamblyteles suturalis Townes, 1951, Synoptic Catalog, p. 295, ♀.
Eutanyacra suturalis Heinrich, 1959, Entom. News, p. 210, ♀ ♂.

Types

Holotypes.—*Ichneumon suturalis* Say, ♀, Colorado. Lost. *Ichneumon grotei* Cresson, ♂, Colorado. A.N.S. *Ichneumon propinquus* Cresson, ♀, Colorado. A.N.S.

Hosts

Actebia fennica Tausch in British Columbia (C.N.C.).

Distribution

According to H. Townes 1951 (*grotei*): "Colorado, Alberta"; (*suturalis*): "Colorado". New records (♀ ♀): British Columbia, Northwest Territories, Manitoba; (♂ ♂) Saskatchewan, Manitoba, Quebec, Labrador, Ontario, New Brunswick (C.N.C.).

Preamble

The association of *propinquus* ♀ and *grotei* ♂ has been proved by a series of both males and females reared from the same host, *Actebia fennica* in British Columbia (C.N.C.). As the type of *suturalis* Say is lost I am considering the synonymy of *propinquus* and *suturalis* as established by H. Townes. See also remark at the end of this species.

Female

Ferruginous including scutellum; flagellum without annulus; cheeks scarcely inflated; mesosternum in type specimen with longitudinal, black median stripe, which is widened at the apex; black are usually also: prepectus partially or en-

tirely, scutellar and propodeal sutures, apex of prosternum, basal band on third or third and fourth tergites; wings often moderately infuscated; length 11-14 mm.

Flagellum.—Bristleshaped, long and extremely attenuated toward apex, not widened beyond middle, with 39-42 segments, the first about 1.5 times as long as wide, the fifth square. Ferruginous, without annulus, the apical part blackish.

Head.—Temple and cheek profiles somewhat narrowed, both with slightly curved outlines; temples not, cheeks scarcely inflated. Ferruginous.

Thorax.—Mesoscutum scarcely convex, notauli obsolete; scutellum slightly raised above postscutellum, area superomedia square or somewhat wider than long. Ferruginous with restricted black pattern; in the type and most of the western specimens mesosternum with narrow longitudinal median band which is widened at the apex. Usually also black in western specimens: base and apex of prosternum, prepectus partially or entirely, upper and apical margin of mesopleura, propodeal and scutellar sutures.

Legs.—Moderately slender; femora III relatively a trifle longer than in *vilissima*. Uniformly ferruginous including coxae and trochanters.

Abdomen.—Median field of postpetiolus longitudinally striate; gastrocoeli shallow, thyridia narrow or subobsolete; second and third tergites fairly strongly and densely, the fourth much more finely and less densely, but still distinctly, punctured. Ferruginous; usually third, or third and fourth tergites with black basal band, sometimes the petiolus basally blackish too.

Male

Flagellum without annulus, usually entirely or dorsally black; thorax black and ferruginous with a very variable distribution, sometimes predominantly black, sometimes predominantly ferruginous; in typical western specimens scutellum and other areas yellow; abdomen ferruginous with more or less extensive black basal bands on tergites 1-5 or 6, in most western and some eastern specimens anterior tergites apically pale yellowish tinted; legs ferruginous (exceptionally coxae and femora III infuscated); usually tibiae III apically infuscated or black; length 14-16 mm.

Flagellum.—With long, parallel-sided tyloides on segments 2-32 or 35, which on segments 3 to about 14 reach approximately from bases to apices of segments, forming a continuous ridge. Black; sometimes basally on ventral side, exceptionally predominantly ferruginous; scape ventrally yellow or yellowish.

Head.—Face and clypeus yellow; in the type of *grotei* and the majority of western specimens middle of frons, ocellar region and occipital region broadly black, the rest ferruginous; in eastern specimens black pattern usually restricted to supraantennal foveae.

Thorax.—Scutellum fairly strongly convex; area superomedia usually transverse. Black pattern in western specimens fairly extensive; the following are usually black: prosternum, mesosternum to sternauli, middle of pronotum, band on mesopleura below subalarum, base and apex of median lobe of mesoscutum; areae coxales and propodeal and scutellar sutures; sometimes sterna, pleura and even the mesoscutum predominantly black; the following are usually yellowish: collare, pronotal ridge apically, tegulae, subalarum, scutellum, sometimes propodeum partially; the rest ferruginous; in eastern specimens black and yellow pattern usually much more restricted, thorax usually predominantly ferruginous.

Legs.—Ferruginous; apex of tibiae III brownish infuscated or black, base of tibiae III usually yellowish tinted; in western specimens coxae often extensively

infuscated or predominantly black, exceptionally femora III infuscated; in eastern specimens legs usually entirely ferruginous including coxae.

Abdomen.—In the type of *grotei* and western specimens usually tricolored: ferruginous with black basal bands of variable extent on tergites 2-4 or 6, the apices of tergites 1-2 or 3 usually yellowish tinted; in extremely melanistic specimens sometimse tergites 4-6 almost entirely black. In eastern specimens black pattern usually reduced, yellow pattern obsolete.

Remarks

I suspect that the predominantly ferruginous males with restricted black and obsolete yellow pattern, included in the description above, may perhaps represent a different species, especially as their tyloides seem to be somewhat narrower. Males of this kind are found mainly in the eastern part of North America, but do occur at least as far west as Saskatchewan, where they were reared from *Euxoa flavicollis* Smith and *Euxoa ochrogaster* Guenée (C.N.C.). I was, however, unable to find trustworthy and constant characters in order to distinguish the femlaes, reared from the same hosts, from *suturalis* females. It remains to be investigated whether we are dealing here with a variable species or with a complex of two sibling species.

11. *Eutanyacra vilissima*, new species

Figs. 19, 21, 23, 31, 55

Distribution

From Quebec and Ontario South to Virginia, west to British Columbia; probably Transcontinental in Transition Zone.

Preamble

A species of the *suturalis* group; in size, morphology and color rather similar to *suturalis* Say, but distinguished by a white annulus on flagellum in the female. Males are similar in appearance to males of the *laetus* group of the genus *Ichneumon*, the abdomen being bright lemon yellow with black basal bands on tergites 1-4 and the apical three segments being predominantly black. The most common species of the genus in the east. Varies considerably individually as well as geographically.

Female

Flagellum with white annulus; head and thorax ferruginous with variable black pattern; in northern populations sterna and pleura usually predominantly black; scutellum white or ferruginous; abdomen ferruginous, in northern populations usually tergites 1-4 or 1-3 with black basal bands of varying extent, exceptionally tergites 1-3 almost entirely black or not at all black banded; legs ferruginous, coxae black, or ferruginous; femora III apically not black, tibiae III but exceptionally apically infuscated; temples and cheeks not inflated; length 11-14 mm, usually 12 mm.

Flagellum.—Bristleshaped, long and extremely attenuated toward apex, ventrally not distinctly flattened and scarcely widened beyond middle, with 37-42 (usually 37 or 38) segments, the first about twice as long as wide, the fifth or sixth square, the widest about square. Black with white annulus on segments 5 or 6 to 11 or 12, the scape and basal segments usually apically and ventrally more extensively, sometimes predominantly, or, in southeastern populations, entirely, ferruginous.

Head.—Temple and cheek profiles but slightly narrowed, the former with distinctly, the latter slightly curved outlines; temples and cheeks not distinctly inflated; malar space almost as long as width of base of mandible; upper mandibular tooth blunted. Black with obscure ferruginous pattern of varying extent on face, clypeus and orbits, often extensively, or in southern populations entirely, ferruginous, exceptionally in northern populations entirely black.

Thorax.—Mesoscutum and scutellum almost flat, the latter slightly raised above postscutellum; notauli subobsolete; area superomedia square or somewhat wider than long. Varying individually and geographically between predominantly black and predominantly ferruginous; in northern populations pleura and sterna usually predominantly black, in the southern subspecies predominantly ferruginous; scutellum in *vilissima vilissima* yellow, exceptionally as ferruginous as the mesoscutum, in southern populations usually ferruginous.

Legs.—Moderately slender. Ferruginous, coxae in northern populations predominantly or entirely black; apex of femora III never conspicuously black, usually ferruginous like the rest, exceptionally restrictedly infuscated, apex of tibiae III but exceptionally infuscated.

Abdomen.—Ferruginous, anterior tergites, at least the second, in northern populations usually the first to third or fourth with black basal bands.

Male

Flagellum without annulus; black, with rich, very variable, clear lemon-yellow pattern; scutellum yellow, tergites 1-4 lemon-yellow with narrow, black basal bands; propodeum more or less extensively yellow marked; often mesopleura yellow marked; sometimes mesoscutum with small, yellow median marks, or short, lateral stripes near tegulae; femora III black, I and II usually dorsally black marked; length 13-16 mm.

Flagellum.—With narrow, long, bacilliform tyloides on segments 2 to about 28 or 30. Dorsally and ventrally black; scape ventrally yellow.

Head.—Black; the following are yellow: mandibles except teeth, clypeus, face, lower half or full length of frontal orbits, often apex of cheeks and outer orbits narrowly, sometimes orbits around eyes; sometimes cheeks and outer orbits not yellow marked.

Thorax.—Black; the following are yellow: pronotal ridge, subalarum, tegulae, scutellum, postscutellum, pronotal base, partially or entirely, propodeum more or less extensively, in southern populations almost entirely, often a mark of variable extent on mesopleura, sometimes median marks on mesoscutum, prescutellar carinae, short lateral lines on mesoscutum near tegulae.

Legs.—Black and yellow; the following are yellow: coxae I and II apically or predominantly, coxae III usually ventrally at apex, often also dorsally in part or entirely, all trochanters and trochantelli, femora I and II ventrally and apically (dorsally black in northern, pale rufous in southern populations), tibiae and tarsi I and II, tibiae III except apex; tarsi III moderately infuscated except base.

Abdomen.—Black; postpetiolus and tergites 2-4 bright lemon-yellow, petiolus and comparatively narrow basal bands on tergites 2-4 black; sometimes also the fifth tergite apically yellow; apices of apical tergites usually obscure ferruginous.

11a. *Eutanyacra vilissima vilissima*, new subspecies

Types

Holotype.— ♀, Maine, Dryden, G. H. Heinrich. C.G.H.

Allotype.— ♂, Maine, Dryden, G. H. Heinrich. C.G.H.

Paratypes.–5 ♀ ♀, Maine, Dryden; 5 ♀ ♀, Quebec, Gatineau, G. H. Heinrich. C.G.H. 10 ♀ ♀, Ontario, Constance Bay; 38 ♀ ♀, Quebec, Gatineau, Poltimore, Aylmer. G. H. Heinrich. C.N.C. No. 7208.

Distribution

Ontario, Quebec, Michigan, Maine (C.G.H.); Massachusetts (M.C.Z.); New York (C.N.C.).

Female

Head, sterna, pleura and coxae usually predominantly black, scutellum yellow; usually tergites 1-3, often 1-4 basally black banded.

Male

Mesoscutum much more often uniformly black than medially or laterally yellow marked; yellow pattern on propodeum more or less restricted, very rarely occupying almost its entire surface; femora I and II dorsally more or less extensively black.

11b. *Eutanyacra vilissima rubricosa*, new subspecies

Types

Holotype.– ♀, Maryland, College Park, hibernating, Gerd H. Heinrich. C.G.H.

Allotype.– ♂, Maryland, Plummers Island. C.G.H.

Paratypes.–26 ♀ ♀, Maryland, College Park and Silver Spring. C.G.H.

Distribution

Maryland, West Virginia (C.G.H.). In Quebec, Ontario, New England, New York sporadically as mutant of *vilissima vilissima*.

Preamble

I was long in doubt whether I should consider this form as a species, subspecies or mere mutant. The facts are that, in spite of repeated, careful examination, not the slightest morphological difference from *vilissima vilissima* could be found, and furthermore that in the northeastern part of the distribution of the species, specimens have been found which seemed to link the two color patterns. Thus a specific status could not be assumed. In the southern part of the range the erythristic form *rubricosa* seems to have achieved the character of a subspecies by having repressed the melanistic *vilissima* entirely, while in the northern part the latter is strongly predominant, but erythristic specimens still occur there occasionally.

Female

Ferruginous; head without, thorax with very restricted, black pattern; base of tergites 1-4 usually narrowly infuscated; scutellum ferruginous like the rest, rarely yellowish tinted.

The following are black; base and apex of prosternum, prepectus predominantly, longitudinal median band on mesosternum, median transverse line on pronotum, line below subalarum, mark on mesopleura in front of coxae II, scutellar and propodeal sutures, base and ventral side of petiolus, basal band on third tergite, restricted, narrow infuscation on apex of third and base of fourth tergites, sometimes gastrocoeli.

Male

Males from the type locality differ but slightly from *vilissima vilissima* by

somewhat more extended yellow pattern on thorax: propodeum usually almost entirely yellow, mesoscutum usually medially and laterally yellow marked; femora I and II dorsally not black marked.

12. *Eutanyacra solitaria*, new species

Figs. 20, 22, 24, 34, 38

Types

Holotype.—♀, Ontario, Ottawa, 1956, hibernating, Gerd H. Heinrich. C.G.H.

Allotype.—♂, Ontario, Gananoque, 9.VII.1941. C.N.C. No. 7213.

Paratypes.—3 ♀♀, Ontario, Ottawa, Trenton, Guelph; 1 ♀, New York, Ithaca. C.N.C. No. 7213. 6 ♀♀, Ontario, Ottawa, Constance Bay, Marmora; 2 ♀♀, Quebec, Gatineau. C.G.H.

Distribution

Ontario, Quebec, New York. Females found hibernating solitarily in stumps.

Preamble

Females are distinguished by a white annulus on flagellum, a predominantly light ferruginous color and a yellow, rather flat, scutellum. They are very similar to *vilissima*, new species, and *munifica* (Cresson), differing from the latter by somewhat more slender femora and basal segments of flagellum, and the less broadly blunted upper mandibular tooth, from the former by wider temples and cheeks and the reduction of black pattern; the tentatively associated male has a white annulus on flagellum.

Female

Light ferruginous, scutellum yellow; often face laterally and clypeus with yellow pattern; flagellum with white annulus; third, sometimes also the fourth tergite with black basal band; thorax with restricted black pattern; femora moderately stout; cheeks and temples wide; upper mandibular tooth moderately blunted; length 13-15 mm.

Flagellum.—Bristleshaped, long attenuated with acute apex, not widened beyond middle, with 40 or 41 segments, the first almost twice as long as wide, the fifth square. Ferruginous with whitish annulus on segments 5-12, scape ferruginous.

Head.—Temple and cheek profiles scarcely narrowed, with curved outlines; cheeks and temples slightly inflated; malar space a little longer than width of base of mandible; upper mandibular tooth blunted, but not as wide as in *munifica*. Ferruginous; often sides of face and clypeus yellowish tinted.

Thorax.—Mesoscutum and scutellum flat, the latter scarcely raised above postscutellum; notauli obsolete; area superomedia as wide as, or somewhat wider than, long. Ferruginous, scutellum yellow; the following are black: middle of pronotum narrowly, base and apex of prosternum, prepectus, median band on mesosternum (apically widened), band on mesopleura below subalarum, apical border of mesopleura, propodean and scutellar sutures.

Legs.—Femora, particularly femora I and II less stout than in *munifica*. Uniformly ferruginous, including coxae and trochanters.

Abdomen.—Second tergite fairly strongly and densely, the third somewhat less strongly and densely punctured. Ferruginous; tergites 2-4, or at least the third with narrow black basal bands.

Male

(Tentative.)

The male associated here tentatively with *solitaria* ♀ agrees in color and appearance with *suturalis* (Say) ♂, differing evidently in nothing else than the presence of a white annulus on flagellum.

Ferruginous with black and pale yellow pattern; flagellum with white annulus; tergites 2-6 with well-pronounced black basal, 1-3 also with pale yellow apical, bands; scutellum entirely, propodeum predominantly yellow; legs predominantly rufous; length 15 mm.

Flagellum.—With long, bacilliform tyloides on segments 3-24, the longest on segments 3-9 reaching nearly, but not quite, from base to apex of segments. Black; basal 1-2 segments often entirely, the following segments up to the annulus often ventrally ferruginous; scape ventrally yellow.

Head.—Ferruginous, yellow and black; the following are yellow: mandibles except teeth, clypeus, face, frontal orbits, cheeks up to temple region; the following are black: a triangular mark on frons (including the supraantennal cavities and the lower ocellus) and a line on exterior side of each upper ocellus, running backward to the occipital carina.

Thorax.—Ferruginous, black and yellow; the following are yellow: collare, pronotal ridge and base, subalarum, tegulae, scutellum, postscutellum, propodeum predominantly, a band on mesopleura, following their lower and anterior borders; the following are black: base of prosternum, prepectus, mesosternum, band on mesopleura below subalarum, areae coxales, propodeal and scutellar sutures, a longitudinal patch on base of median lobe of mesoscutum; mesoscutum with indistinctly yellowish tinted longitudinal median and lateral stripes.

Legs.—Ferruginous, black and yellow; the following are black: base of coxae II and III narrowly, apex of tibiae III; apex of femora III infuscated; the following are yellow: all trochanters and trochantelli, coxae I and II predominantly, all tarsi; tibiae III basally, tibiae I and II predominantly, femora I and II partially yellowish tinted.

Abdomen.—Ferruginous, black and yellow; the following are black: petiolus ventrally, basal bands on tergites 2-3 or 4 or 6; tergites 1-3 with pale yellow apical bands.

13. *Eutanyacra validiceps*, new species

Types

Holotype.—♀, Ontario, Sudbury, 21.VII.1889. C.N.C. No. 7209.
Allotype.—♂, Quebec, Montigny. C.G.H.
Paratype.—1 ♂ Maine, Mt. Blue. C.G.H.

Distribution

Ontario, Quebec, Maine (♂ C.G.H.).

Preamble

Another species of the *suturalis* group, similar to *vilissima*, but somewhat smaller and distinguished by inflated temples and cheeks; chromatically characterized by the black apex of femora III and tibiae III in both sexes.

Female

Flagellum with white annulus; ferruginous with restricted black pattern on thorax, abdomen and hind legs; tergites 2 and 3 with broad, black basal bands;

apex of femora III and tibiae III broadly black; temples and cheeks strongly inflated, head in front view almost rectangular, a little wider than long; length 10.5 mm.

Flagellum.—Bristleshaped, long attenuated toward apex, and acutely pointed, not widened beyond middle, the first segment less than twice as long as wide, the sixth square. Ferruginous, segments 5-12 with whitish annulus, apex black; scape ferruginous.

Head.—Temples inflated, their outline widened rather than narrowed, broadly curved; cheeks inflated, very wide between eyes and carina genalis; cheek profile not narrowed, with distinctly curved outline; head in front view a little wider than long; upper mandibular tooth but slightly blunted. Uniformly ferruginous.

Thorax.—Mesoscutum slightly convex; notauli obsolete; scutellum a little raised above postscutellum; area superomedia approximately square. Ferruginous, the following are black: base and apex of prosternum, a longitudinal median stripe on mesosternum (widened toward apex), pronotum medially, mesopleura on apical border and in front of coxae II, areae coxales partially or entirely, scutellar and propodeal sutures.

Legs.—Moderately slender. Ferruginous including coxae and trochanters; apex of femora and tibiae III broadly black; segments of tarsi III apically infuscated.

Abdomen.—Median field of postpetiolus longitudinally striate, lateral fields densely punctured; gastrocoeli with narrow thyridia; second and third tergites distinctly and densely punctured. Ferruginous, second and third tergites with broad black basal band.

Male

Flagellum with white annulus; ferruginous with restricted black pattern on head, thorax, abdomen and hind legs; tergites 2-4 with black, basal bands; apex of femora III and tibiae III broadly black; scutellum, face and clypeus yellow; temples broadly rounded; length 12 mm.

Flagellum.—With long, bacilliform tyloides on segments 3-21. Dorsally black, except first segment, with yellowish annulus on segments 8-14, ventrally pale ferruginous, except apex beyond annulus.

Head.—Temples scarcely narrowed, with broadly rounded outline; malar space less than half as long as width of base of mandible. Ferruginous; the following are black: supraantennal cavities, middle of frons and ocellar region; clypeus and face yellow; cheeks also yellowish tinted.

Thorax.—Ferruginous; the following are black: prosternum, prepectus, middle of pronotum, mesosternum, mesopleura on apical border, in front of coxae III and narrowly below subalarum, areae coxales, scutellar and propodeal sutures.

Legs.—Ferruginous, including coxae and trochanters; coxae III ventrally toward apex, broad apex of femora III and of tibiae III, black; metatarsus III somewhat infuscated, the following segments pale.

Abdomen.—Ferruginous; the following are black: petiolus ventrally and basal bands on second to fourth tergites.

14. *Eutanyacra munifica* (Cresson)

Figs. 36, 40

Ichneumon nobilis Cresson, 1864, Ent. Soc. Phila. Proc., 3:155, ♂ (preocc.).
Ichneumon munificus Cresson, 1867, Amer. Ent. Soc. Trans., 1:290, ♂ (new name).
Pseudamblyteles munificus Townes, 1951, Synoptic Catalog, p. 293, ♂.
Eutanyacra munifica Heinrich, 1959, Entom. News, 70:210, ♂.

Types

Holotype.– ♂, Illinois. A.N.S.

Neallotype.– ♀, Nova Scotia, Digby, 29.V.1911. C.N.C. No. 7212.

Distribution

According to Henry Townes 1951: "Atlantic to Illinois in Upper Austral Zone. Overgrown fields in fall". Females associated below tentatively are recorded from: Saskatchewan, Nova Scotia (C.N.C.); New York, New Brunswick (U.S.N.M.); New Hampshire (M.C.Z.); Maryland, Ohio (C.H.T.).

Preamble

The type looks like an oversized male specimen of *vilissima*, new species, and agrees chromatically with it; it seems to me that the temple profile is a little more widened and rounded, but I do not feel quite sure of this difference. On the other hand, the large size suggests another species. From lack of material and lack of field observations I am not in position to decide the problem. Supposing that *munifica* is specifically different from *vilissima*, the possibility to which I am inclined to give preference, the female described below represents then the single eastern species matching it in size. If the type represents an oversized specimen of *vilissima*, than the latter name would have to be sunk into synonymy and the females described below named as a new species.

Male

Black with very rich lemon-yellow pattern; scutellum, propodeum predominantly, broad apical bands on tergites 1-4 and a narrow one on the fifth tergite, yellow; all coxae partially, all trochanters, tibiae and tarsi almost entirely yellow; apical tergites ferruginous; length 19 mm. (9 lines).

Flagellum.–With long, parallel-sided tyloides on segments 3-32. Black; scape ventrally yellow.

Head.–Temple profile rather wide, with rounded outline; malar space less than half as long as width of the base of mandible, mandibles robust, with blunted upper tooth. Black; the following are yellow: mandibles except teeth, face, clypeus, orbits around eyes (almost interrupted at level of lower ocellus, narrowly interrupted at malar space), apical patch on cheeks, or cheeks entirely.

Thorax.–Black; the following are yellow: collare, pronotal ridge, pronotal base, subalarum, tegulae, small, longitudinal, lateral marks on mesoscutum near tegulae, scutellum, postscutellum, propodeum predominantly (including areae spiraculiferae, areae dentiparae, area superomedia, upper part of area posteromedia and parts of areae posteroexternae).

Legs.–The following are yellow: coxae I and II except base, coxae III dorsally in the middle and ventrally at apex, all trochanters and trochantelli, all tibiae, except apex of tibiae III, and all tarsi; femora I and II dorsally reddish, femora III black.

Abdomen.–Black; tergites 1-4 with broad, yellow, apical bands which cover more than half of second and third tergites; fifth tergite with narrow, yellow apical band; last tergites increasingly ferruginous toward apex of abdomen.

Female

(Tentative.)

Ferruginous, scutellum yellow; flagellum with annulus; third, or third and fourth, tergites with narrow, black basal bands, thorax with restricted black pattern; often apex of postpetiolus, sometimes also second tergite apico-laterally

yellowish marked; femora, especially femora I and II, very stout; cheeks and temples wide; upper mandibular tooth broadly blunted, nearly shovel-shaped; length 14-16 mm.

Flagellum.—Bristleshaped, long-attenuated and acutely pointed at apex, not widened beyond middle, with 43 segments, the first about 1.3 times as long as wide, the third or fourth square. Ferruginous, with whitish annulus on segments 7-12; scape ferruginous.

Head.—Temple and cheek profiles scarcely narrowed, with slightly curved outlines; cheeks very wide between eye and carina genalis, about twice as wide as the median transverse diameter of the eye (seen in lateral view); malar space about as long as the width of base of mandible; upper mandibular tooth broadly blunted, shovel-shaped (Fig. 40). Ferruginous.

Thorax.—Mesoscutum and scutellum flat, the latter moderately raised above post-scutellum; notauli slightly indicated at base; area superomedia wider than long. Ferruginous; scutellum usually yellowish; the following are black: pronotum medially, base and apex of prosternum, prepectus, mesosternum medially, band on mesopleura below subalarum and mark on their lower apical part in front of coxae II, areae coxales, scutellar and propodeal sutures, sometimes middle of propodeum.

Legs.—Femora very stout, the ventral, longitudinal deepenings on femora I and II very strongly developed (Fig. 36). Uniformly ferruginous.

Abdomen.—Second tergite strongly and fairly densely, the third somewhat less strongly and densely, the fourth indistinctly, punctured. Ferruginous; the third, often also the fourth, tergite with black basal band; often the postpetiolus with yellowish apical pattern (lateral marks or band), sometimes also the second tergite apico-laterally with indistinctly defined yellowish patches.

15. *Eutanyacra saguenayensis* (Provancher)

Ichneumon saguenayensis Provancher, 1888, Hym. Add., VII, pp. 356-57, ♂.
Pseudamblyteles saguenayensis Townes, 1951, Syn. Cat., p. 293, ♂.

Types

Lectotype.—♂, Quebec. Seminaire de Chicoutimi, Chicoutimi, Quebec. (According to H. Townes, the type is in bad condition: flagella beyond 3rd segment, abdomen beyond fifth segment, and sternites are missing).

Neallotype.—♀, Michigan, Huron Mts. C.H.T.

Distribution

Quebec (type); Michigan (C.H.T.); Maine (C.G.H.).

Preamble

I did not see the type, but H. Townes examined it many years ago. According to his notes kindly communicated to me, the type is slightly larger than *munifica* (Cresson), the pale markings are more extensive, though in the same pattern; clypeus and face are slightly longer, the scutellum is narrower; row of tyloides begins on the second flagellar segment. According to the original description: "each tergite black at the base, red in the middle and yellow at apex. The last tergites entirely reddish-yellow".

Although the hypopygium of the type is missing, in this case the chromatic characters combined with the fact that the row of tyloides begins on the second flagellar segment is sufficient to clarify the generic position of the species. More

difficult is the identification of the species. Here the size is of great importance. According to the original description the type measures 0.63 inches, or about 16 mm. According to H. Townes, however, the lectotype is larger than that, even slightly larger than *munifica*, which suggests a length of about 18-20 mm. This, then, is the size we have to depend upon. Besides *munifica* there occurs but one species of the mentioned length in eastern North America. A series of 3 males and 3 females of this species collected in 1959 by H. Townes at the same time and locality (Michigan, Huron Mts.) gave me an opportunity to interpret the species and to associate the sexes.

Males as well as females have the general appearance of giant specimens of *vilissima rubricosa*, new subspecies, and are so closely related to the latter species that I would scarcely dare to consider them as representatives of a distinct species were it not for the striking difference in size which is not bridged over by intergrades.

Males of *saguenayensis* differ from *vilissima*, new species, mainly by size and by the greater number of flagellar segments (about 44 in contrast to 38-40 in *vilissima*). Some specimens display an erythristic tendency (medially orange tinted anterior tergites and partially orange thoracic pattern) which is absent in *vilissima*. They are also extremely similar in color as well as in size to *munifica*, from which they differ but slightly by a somewhat more narrowed temple profile and an apically more narrowed scutellum, mainly, however, by a somewhat narrower abdomen.

Male

Flagellum without annulus; black, with rich lemon-yellow and sometimes pale ferruginous or orange pattern; scutellum yellow, tergites 1-3 or (usually) 4 lemon-yellow with black basal bands, sometimes (as in type) orange between black bases and yellow apices; mesopleura yellow marked; propodeum more or less extensively yellow or orange marked; mesoscutum usually with yellow or orange median marks and short, lateral stripes near tegulae; femora III black, II and III usually dorsally black marked; length 18-20 mm.

Flagellum.—With about 44 segments and with narrow, bacilliform tyloides on segments 2 to about 34, the longest on segments 4-15 reaching from bases to apices of segments, forming a continuous ridge. Black; scape ventrally yellow.

Head.—Temple profile distinctly narrowed with slightly curved outline; malar space scarcely half as long as width of base of mandible; upper mandibular tooth blunted. Black; the following are yellow: mandibles except teeth, face, clypeus, orbits around eyes, cheeks.

Thorax.—Scutellum narrowed toward apex, laterally perpendicularly declivous. Black; the following are yellow: prosternum laterally, collare, pronotal ridge, pronotal base, subalarum, tegulae, small, longitudinal, lateral marks on mesoscutum near tegulae, sometimes median marks on mesoscutum, marks on prescutellar carinae, scutellum, postscutellum, propodeum more or less extensive marks on mesopleura; anterior part of pronotal ridge, markings on mesoscutum and propodeum sometimes orange instead of yellow.

Legs.—Black; the following are yellow: coxae I and II except base, coxae III ventrally at apex, sometimes dorsal marks on coxae III, all trochanters and torchantelli, all tibiae except apex of tibiae III, all tarsi except infuscated apex of tarsi III, apex and anterior side of femora I and II; femora I and II dorsally reddish or marked with black, femora III black.

Abdomen.—Narrower than in *munifica;* second tergite distinctly longer than apically wide, the third about 1.5 times as wide as medially long. Black; tergites 1-4 or 1-3 with broad, yellow, apical bands, the following tergites apically narrowly ferruginous; sometimes anterior tergites tricolored, with an orange belt between the black basal and yellow apical bands.

Female

The female associated below with *saguenayensis* agrees with *munifica* in size and general color pattern but differs distinctly by moderately narrowed temple and cheek profiles and by considerably more slender femora. It is morphologically almost identical with *vilissima* from which I can distinguish it only by the considerably larger size and longer flagellum (44-47 segments in contrast to 37-42 in *vilissima*). The same differences concerning size and number of flagellar segments apply to *solitaria.*

Ferruginous, including scutellum; flagellum with annulus; third and fourth tergites with black, basal bands, often also base of petiolus and region of gastrocoeli black; thorax with restricted black pattern; femora moderately slender; temple and cheek profiles slightly narrowed; upper mandibular tooth moderately blunted; length 14-16 mm.

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally flattened but not widened beyond middle, with 44-47 segments, the first not quite twice as long as wide, the fifth square. Ferruginous with white annulus on segments 5 or 6 to 12 or 13, the apex black; scape ferruginous.

Head.—Temple and cheek profile moderately narrowed with slightly curved outlines; malar space about as long as width of base of mandible; upper mandibular tooth moderately blunted. Ferruginous.

Thorax.—Mesoscutum and scutellum flat, the latter a little raised above postscutellum; notauli slightly indicated at base or obsolete; area superomedia wider than long. Ferruginous; the following are black: base and apex of prosternum, pronotum medially, prepectus, narrow, median line on mesosternum, or mesosternum predominantly, band on mesopleura below subalarum, mark on their lower apical part in front of coxae II, scutellar and propodeal sutures.

Legs.—Femora moderately slender. Uniformly ferruginous.

Abdomen.—Thyridia narrow but rather distinct; second tergite strongly and densely, the third somewhat less densely, the fourth finely and sparsely but fairly distinctly, punctured. Third and fourth tergites with distinct, black, basal bands, sometimes also region of gastrocoeli and base of petiolus black.

16. *Eutanyacra trivittata*, new species

Types

Holotype.— ♀, Quebec, Rupert House, 5.VIII.1949, E. J. Le Roux. C.N.C. No. 7250.

Allotype.— ♂, Quebec, Limbour, 26.VI.1959. C.G.H.

Paratype.—1 ♀, Quebec, Granby, 25.VIII.1937. C.H.T.

Distribution

Quebec.

Preamble

The female is chromatically well distinguished by the black basic color of abdomen, with broad, yellow, apical bands on tergites 1-3. In contrast to

vilissima, new species, femora III are finely and densely punctured on interior and exterior side and the scutellum is more strongly convex. The male is rather similar to *vilissima*, but has only tergites 1-3 yellow banded (in this respect like its own female), shorter hypopygial process and more slender femora III.

Female

Black, scutellum yellow, tergites 1-3 with broad, yellow, apical bands; propodeum yellow (or ferruginous) marked; base of flagellum extensively pale yellowish; femora III densely and finely punctured; clypeus before apical border slightly concave; length 11 mm.

Flagellum.—Bristleshaped, extremely attenuated, with acute apex, ventrally flattened beyond middle but not widened, the first segment about twice as long as wide, the eighth approximately square. Segments 1-11 or 12 pale reddish-yellow, apex black; scape black.

Head.—Temple profile scarcely narrowed with curved outline, cheek profile slightly narrowed with slightly curved outline; malar space nearly as long as width of base of mandible; upper mandibular tooth moderately blunted; clypeus wide, somewhat depressed before apical border, the latter slightly bent upward. Black; frontal orbits narrowly yellowish or ferruginous.

Thorax.—Mesoscutum slightly convex, densely and fairly strongly punctured, scarcely shiny; scutellum distinctly raised above postscutellum and strongly convex; area superomedia a little wider than long (in type), sometimes a little longer than wide. Black; scutellum, subalarum and areae dentiparae yellow; pronotal ridge and tegulae obscure reddish to blackish.

Legs.—Moderately slender; femora III more slender than in *vilissima*, finely and densely punctured. Black; all tibiae and tarsi I and II yellowish; tibiae III apically broadly black, tarsi III brownish infuscated, trochantelli partially brown; femora I and II apically yellowish or brownish.

Abdomen.—Median field of postpetiolus longitudinally striate; gastrocoeli fairly distinctly impressed; second and third tergites fairly strongly and very densely punctured, almost opaque. Black; first to third tergites with broad, yellow, apical bands occupying about half of segments; last tergite obscure ferruginous.

Male

Flagellum without annulus, black, basally on ventral side ferruginous; scutellum and broad apical bands on tergites 1-3 yellow (fourth tergite usually with inconspicuous, narrow, medially interrupted, apical band); propodeum extensively yellow marked; mesopleura without yellow pattern; coxae predominantly and the femora III black; length 13 mm.

Flagellum.—With 39-41 segments and with narrow, bacilliform tyloides on segments 2-21, which, except the first and last three, reach from bases to apices of segments, forming a continuous ridge. Black, about basal half ventrally ferruginous; scape ventrally yellow.

Head.—Temple profile inconspicuously narrowed, broadly rounded; malar space half as long as width of base of mandible; clypeus fairly wide, slightly depressed before apical border. Black; the following are yellow: mandibles except teeth, clypeus, face, frontal orbits, mark on lower part of outer orbits, sometimes outer orbits up to temple region.

Thorax.—Scutellum rather strongly convex. Black; the following are yellow: collare, restricted pattern on pronotal base, pronotal ridge; subalarum,

tegulae partially, scutellum (not postscutellum), propodeum extensively, sometimes predominantly.

Legs.—Femora III densely and finely punctured, more slender than in *vilissima.* Black and yellow; the following are yellow: usually restricted marks on coxae I and II, sometimes also dorsal marks on coxae III, trochanters partially, trochantelli, tibiae and trasi I and II, tibiae III except broadly black apex; tarsi III infuscated; femora I and II varying from predominantly rufous to predominantly black; femora III always black.

Abdomen.—Median projection of hypopygium shorter than in *vilissima.* Black; postpetiolus and apical half of tergites 2 and 3 lemon-yellow, fourth tergite usually with narrow, latero-apical marks.

20. Genus *Ctenichneumon* Thomson

Ctenichneumon Thomson, 1894, Opusc. Entom., fasc. 19, p. 2082.

Type-species.—Ichneumon funereus Fourcroy. Design. by Ashmead 1900.

Dochyteles Berthoumieu, 1904, in Wytsman, Gen. Ins., fasc. 18, p. 50.

Type-species.—Ichneumon funereus Fourcroy. Design. by Viereck 1914.

In general appearance and in most of the morphological characters, females of this genus are similar to *Pseudamblyteles* Ashmead, sharing with the latter particularly the obsoletion of the thyridia and the shape and amblypygous structure of the abdomen. As a rule, however, in *Ctenichneumon* the gastrocoeli are deeper impressed than in *Pseudamblyteles* and the sculpture of anterior tergites is coarser and denser. Besides, a uniformly black or red colored abdomen strongly suggests a *Ctenichneumon* species (see also the paragraph below concerning color). Nevertheless in a few species and specimens, the question whether they belong to the genus *Ctenichneumon* or *Pseudamblyteles* is difficult, if not impossible, to answer, as far as females alone are concerned.

In contrast to many other genera of the tribe, it is this time the male which bears (by its flagellar structure) the most infallible generic character and renders *Ctenichneumon* one of the most clearly defined taxonomic groups among the Ichneumoninae.

Flagellum.—Of female always bristleshaped, more or less slender, never strongly widened beyond middle. Flagellum of male (Figs. 56, 57) is of a peculiar structure. Segments (on side opposite that bearing row of tyloides) with little, transverse ridges or elevations, which are topped by very short bristles, and which surround about three-quarters of each of the segments involved near their middle or closer to their apices than to their bases, giving the whole flagellum a nodulose appearance, the more so, as the incisions between the segments are more pronounced than in other genera and the segments tend, where the flagellum is bent, to part from one another by small crevices.

Head.—Temple and cheek profiles more or less, usually not greatly, narrowed; mandibles normal, moderately slender, the upper tooth acute.

Thorax.—Mesoscutum distinctly convex; scutellum on the average more convex than in *Pseudamblyteles;* area superomedia of the quadrangular type, usually square or slightly wider than long and fairly large, in male usually transverse; apices of areae dentiparae on the average more downward-slanting than in *Ichneumon*, never prominent or with apophyses.

Legs.—Moderately slender to moderately stout; coxae III of female never with scopa; tarsi I and II never widened.

Abdomen.—Of female amblypygous; in both sexes: median field of postpetiolus clearly defined and usually longitudinally striate; gastrocoeli well developed and usually fairly deeply impressed, thyridia, however, obsolete or subobsolete; puncturation of anterior tergites usually rather strong, middle of second tergite basally usually longitudinally striate; sternites more strongly sclerotized than in all other genera of the subfamily: in the type-species ventral plica entirely absent, in the other species usually the first four, at least the first three, sternites without plica.

Color.—Tergites 2-7 in American species entirely either black or red; only in one species several of the anterior tergites ferruginous or red in combination with several black apical tergites (as not seldom occurs in European species); never abdomen banded black and yellow or a white anal pattern present; basic color of head, thorax and femora black or blue. Sexual dimorphism usually moderate; a red color of female abdomen often corresponds to a black color of male abdomen.

Biology.—Females do not hibernate. In the European *Ctenichneumon edictorius* (L.) I observed two generations during the summer. The same seems to be true for the common American *Ctenichneumon excultus* (Cresson). Whether it is a general biological character of the genus remains to be investigated. There are no host records concerning the American species. Some of the European species were reared from Noctuidae.

Distribution.—Temperate Zones of the New and Old Worlds.

Remarks

The definition of the species treated below and the association of their sexes seems to be in general well established. The following are problems still open for further research:

1. The association of the male attributed below to *gracilior*, new species, is not quite certain. It is not impossible that this male belongs to *syphax* (Cresson) or to *rufibasis*, new species, instead.
2. The association of *electus* Cresson as male and synonym with *syphax* is not sufficiently ascertained yet. It is not impossible that this male belongs to *rufibasis* or *gracilior* instead.
3. The male of the species *punctiscuta*, new species, and the female of *ruidosensis* (Cockerell) are unknown. It is not impossible that the former species represents the female and thus is a synonym of the latter.

Key to the Species of *Ctenichneumon* Thomson of America North of Mexico

Females

1. Abdomen uniformly black. 2
   Abdomen partially or entirely red. 5
2. Flagellum short with very stout basal segments, the third segment square; femora III in side view very wide, little more than three times as long as wide; flagellum without annulus. (Scutellum black; second tergite moderately densely punctured, without striation; scutellum flat; length 13 mm.) ..... 5. *holomelas*, new species
   Flagellum longer, the third segment distinctly longer than wide; femora more slender; flagellum with annulus. 3
3. Mesoscutum very densely punctured, nearly opaque; tibiae III with full white annulus; smaller species about 11-12 mm. long. (Scutellum white; white flagellar annulus unusually extensive and prolonged toward base of flagellum.) ..... 4. *minor*, new species
   Mesoscutum moderately densely punctured, more shiny; tibiae III usually uniformly black, sometimes with a small, white dorso-lateral mark; larger species 11-15 mm. long. 4

4. Scutellum black (with very rare exceptions); abdomen with a faint, deep bluish tint; second tergite medially longitudinally striate and rather densely punctured, laterally more sparsely punctured and shiny; third sternite without plica; length 11-15 mm. ..... 2. *excultus* (Cresson)
   Scutellum white; abdomen plain black without any metallic tint; second tergite strongly and very densely punctured on its entire surface, opaque; third sternite with plica; length 15 mm. ..... 3. *columbianus*, new species
5. Head and thorax more or less intensively metallic blue. (Tergites 2-7 vivid red.) 6
   Head and thorax plain black. 8
6. Metallic blue tint on head and mesoscutum rather indistinct; large species, 14-15 mm. long. (No white markings on head and thorax; temple profile distinctly narrowed; mesoscutum finely and sparsely punctured.) ..... 7. *caeruleops*, new species
   Head and thorax including mesoscutum intensively metallic blue, smaller species 11-13 mm. long. (Head and thorax sometimes with white patterns.) 7
7. Temple profile moderately narrowed with slightly curved outline; mesoscutum finely and moderately densely punctured; frontal orbits, pronotal ridge and scutellum usually white or partially so; femora III black. ..... 6. *semicaeruleus* (Cresson)
   Temple profile strongly narrowed with straight outline; mesoscutum rather strongly and densely punctured; frontal orbits, pronotal ridge and scutellum black (sometimes pronotal ridge with white dot); femora III purplish to red. ..... 8. *punctiscuta*, new species
8. Legs, including coxae, almost entirely uniformly red. (Abdomen uniformly red; wings strongly infuscated; length of type 11 mm.) ..... 1. *heteropus*, new species
   Legs predominantly black. 9
9. Wings strongly infuscated. (Tergites 2-7 red; entire first tergite usually black; length 14-17 mm.) 10
   Wings not, or moderately, infuscated. (Tergites 2-7 red; sometimes last tergites black, or first tergite more or less extensively red; length 10-15 mm.) 11
10. Tergites 2 and 3 fairly finely and sparsely punctured, shiny; base of second tergite medially without distinct striation; third sternite without distinct plica; widest flagellar segment scarcely wider than long; coxae III ventrally shiny, moderately strongly and moderately densely punctured, interval of punctures somewhat wider than punctures; subalarum black. (Flagellum with 46-50 segments; length 15-17 mm.) ..... 9. *ultus* (Cresson)
    Tergites 2 and 3 more strongly and densely sculptured; the second tergite almost opaque and medially distinctly striate; third sternite with distinct plica; widest flagellar segment 1.5 times as wide as long; coxae III ventrally more densely punctured and less shiny; subalarum white or white marked. (Flagellum with 44-48 segments; length 14-16 mm.) ..... 10. *townesi*, new species
11. First flagellar segment only twice as long as wide; femora III comparatively stout, 3.3 to 4 times as long as wide, exteriorly finely and moderately densely punctured; first segment, or at least postpetiolus, red. (Wings moderately infuscated; clypeus usually ferruginous; tergites 2-7 red; flagellar annulus extensive, reaching from segments 4 to 11 or 12; second tergite medially longitudinally striate; smaller species, 12-15 mm. long.) ..... 11. *rufibasis*, new species
    First flagellar segment at least 2.5 times as long as wide; femora III slenderer, 4 to 4.4 times as long as wide, exteriorly more distinctly and densely punctured; first segment, in majority of specimens, black. (Tergites 2-7 or sometimes only 2 and 3 red.) 12
12. Scutellum and narrow frontal orbits white; widest flagellar segment seen from flattened side about 1.3 times as wide as long. (Tergites 2-7 rufous; abdomen slightly elongate and approximately parallel-sided; second and third tergites fairly sparsely punctured, without striation, shiny; length 13-15 mm.) ..... 12. *gracilior*, new species
    Scutellum and frontal orbits black, the former sometimes obscure ferruginous; flagellum extremely slender and not at all widened beyond middle, seen from flattened side all segments wider than long. (Occurs in two phases, with either tergites 2-7 rufous, or only 2-3 rufous, and 4-7 black; femora III very slender; length 10-14 mm.) ..... 13. *syphax* (Cresson)

Males

1. Abdomen blue or black, except sometimes last tergite. 2
   Tergites 2-7, or at least 2 and 3, red or orange. 10
2. Abdomen intensively metallic blue. 3
   Abdomen plainly black, only in *excultus* with slight, deep, bluish tint. 5

3. Larger species, 16-18 mm. long; head, mesoscutum and coxae less intensively metallic blue than in the alternative species. (Frontal orbits, median field of face and anterior part of pronotal ridge *not* white; tibiae III with white latero-dorsal stripe beyond base.) ..... 7. *caeruleops*, new species (western)

Small species, 12-14 mm. long; head, mesoscutum and coxae intensively metallic blue. 4

4. Tibiae III with white dorso-lateral stripe beyond base; cheek profile less narrowed than in the alternative species. ..... 6. *semicaeruleus* (Cresson)

Tibiae III without white pattern; cheek profile strongly and distinctly more narrowed than in the alternative species. ..... 14. *ruidosensis* (Cockerell) (western)

5. Mesoscutum very densely punctured, almost opaque; smaller species, 11-13 mm. long. (Tibiae III with full white annulus; postscutellum always, coxae and antennal scape never, white marked.) ..... 4. *minor*, new species

Mesoscutum sparsely or moderately densely punctured, more or less intensively shiny; on the average larger species, 12-19 mm. long. 6

6. Flagellar segments very short, segments of median part of flagellum, beginning from about the seventh, distinctly transverse. (Annulus on tibiae III usually not interrupted ventrally by a black stripe.) 7

Flagellar segments of normal length, segments of median part of flagellum not distinctly transverse. 8

7. Femora III rather slender; propodeum usually more or less extensively white marked on or around area superomedia. (Coxae III usually dorsally predominently white; length 12-15 mm.) ..... 13. (*electus* (Cresson)) = *syphax* (Cresson)

Femora III slightly less slender; propodeum not or restrictedly white marked. (Coxae III dorsally usually on exterior side only, or not at all, white marked; length 15-19 mm.) ..... 9. *ultus* (Cresson)

8. Tibiae III with wide white annulus which is not interrupted ventrally by a black stripe; large species, 16-19 mm. long. (Abdomen without any bluish tint; tergites 2-4 very densely and coarsely punctured, almost opaque; third sternite with plica.) ..... 3. *columbianus*, new species (western)

Tibiae III ventrally black; species of moderate size, 12-16 mm. long. 9

9. Abdomen with slight, dark, bluish tint; white dorsal stripe on tibiae III begins beyond their narrowly black base; apical part of second to fourth tergite usually medially longitudinally striate, coarsely sculptured, somewhat shiny. (Coxae III ventrally but exceptionally white marked; length 12-16 mm.) ..... 2. *excultus* (Cresson)

Abdomen without any bluish tint; white dorsal stripe on tibiae III begins at their very base and extends to beyond their middle; apical part of second to fourth tergites medially not striate, densely punctured, almost opaque. (Coxae III ventrally white marked before apex; length 15-16 mm.) ..... 12. *gracilior*, new species

10. Wings strongly infuscated. (Flagellar segments of median part of flagellum not distinctly transverse.) 11

Wings not, or at the most moderately infuscated. (Flagellar segments of median part of flagellum very short, distinctly transverse.) 12

11. Tergites 2-7 and legs including all coxae and trochanters uniformly red. (Scutellum ferruginous; length 15 mm.) ..... 1. *heteropus*, new species (western)

Tergites 2-7 red, legs including coxae and trochanters predominantly black; all tibiae with white pattern. (Subalarum, and in majority of specimens also at least part of scutellum white; length 16-17 mm.) ..... 10. *townesi*, new species

12. Tergites 2-7 uniformly red; femora III somewhat less slender than in the alternative species; propodeum not white marked. (Length 15-19 mm.; coxae III dorsally white only on exterior side at the most.) ..... 9. *ultus* (Cresson) (variety)

Apical tergites in majority of specimens black; femora III more slender than in the alternative species; propodeum usually more or less extensively, sometimes only inconspicuously, white marked. (Length 12-15 mm.; coxae III dorsally often predominantly white.) ..... 13. (*electus* (Cresson)) = *syphax* (Cresson)

1. *Ctenichneumon heteropus*, new species

Types

Holotype.—♀, British Columbia, Vernon, 8.VI.1937, Hugh Leech. C.N.C. No. 7240.

Allotype.—♂, British Columbia, Robson, 8.VII.1954, H. R. Foxlee, C.G.H.

Distribution

British Columbia.

Female

Wings infuscated; abdomen and legs including all coxae and trochanters red; head and thorax including scutellum and flagellum uniformly black; scape ventrally red; length 11 mm.

Flagellum.—Moderately short, considerably attenuated at apex and acutely pointed, ventrally flattened beyond middle but scarcely widened, with 43 segments, the first more than twice as long as wide, the seventh square, the widest but slightly wider than long. Black, ventrally brownish, scape ventrally bright red.

Head.—Temple profile distinctly narrowed with slightly curved outline, cheek profile moderately narrowed with almost straight outline; malar space about as long as width of base of mandible. Black.

Thorax.—Mesoscutum scarcely convex, fairly finely and not densely punctured, somewhat shiny; notauli obsolete; scutellum dorsally flat and smooth, scarcely raised above postscutellum; area superomedia approximately square, slightly narrowed toward apex. Uniformly black.

Legs.—Moderately slender. Uniformly red; apex of metatarsi III and segments 2-4 of tarsi III blackish infuscated.

Abdomen.—Median field of postpetiolus longitudinally striate, lateral fields irregularly punctate; gastrocoeli rather deeply impressed; second tergite strongly and densely punctured, basally in the middle irregularly, longitudinally striate; third tergite somewhat less strongly, laterally and apically rather finely and less densely punctured; third sternite with plica. Uniformly red.

Male

Wings strongly infuscated, abdomen and legs, including all coxae and trochanters red; basic color of head and thorax black; the following are ferruginous: collare, pronotal ridge predominantly, tegulae, median part of mesoscutum, scutellum, apex of clypeus; facial orbits broadly, frontal orbits narrowly and lateral marks on clypeus pale yellow; length 15 mm.

Flagellum.—With 45 segments and with short, fairly narrow, oval tyloides on segments 5-20, the longest extending from bases to not far beyond middle of segments. Black; side bearing row of tyloides brownish; scape predominantly ferruginous.

2. *Ctenichneumon excultus* (Cresson)

Figs. 56, 57

Ichneumon excultus Cresson, 1867, Amer. Ent. Soc. Trans., 1:293, ♀.
Ichneumon Stadaconensis Provancher, 1875, Nat. Canad., 7:22, 50, ♂.

Types

Holotypes.—Ichneumon excultus Cresson, ♀, New Jersey. A.N.S. *Ichneumon Stadaconensis* Provancher, ♂, Quebec. Provincial Museum Quebec. No. 672.

Distribution

According to H. Townes 1951: "Transcontinental in Canadian and Transition Zones." Habitat: edges of woods and clearings; strip-shaped stands of trees and bushes as those found along roads and stone walls.

Preamble

By far the most common species of the genus in eastern North America. Females are well distinguished by their almost uniformly black (on the abdomen faintly bluish tinted) color, which includes legs II and III, and in the great majority of specimens also the scutellum. Mesoscutum less strongly and densely punctured than in *minor*, new species, in both sexes.

Female

Almost uniformly black; scutellum only exceptionally white marked; tibiae never white banded; flagellum with annulus; third sternite without plica; length 11-15 mm.

Flagellum.—Bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally flattened beyond middle and slightly widened, with 40-44 segments, the first more than twice as long as wide, the tenth square, the widest nearly 1.5 times as wide as long. Black, with annulus on segments 4 or 5 to 12 or 13.

Head.—Temple and cheek profiles moderately narrowed, the former with slightly curved, the latter with almost straight outlines; malar space about as long as width of base of mandible. Black; sometimes a white stripe or mark on inner orbits, level with antennal sockets.

Thorax.—Mesoscutum slightly convex, moderately finely and moderately densely punctured, somewhat shiny, never as densely sculptured as in *minor;* notauli usually indicated, or even distinct at base, sometimse obsolete; scutellum moderately raised above postscutellum, dorsally slightly convex; area superomedia square, or somewhat wider than long. Black; sometimes apex of pronotal ridge white marked, rarely scutellum partially white.

Legs.—Moderately slender. Black; interior side of tibiae I and of apex of femora I, usually also of metatarsus I ivory.

Abdomen.—Median field of postpetiolus, middle of second tergite and base of the middle of third tergite longitudinally striate; second tergite medially densely and strongly punctured, laterally sparsely punctured and shiny; third tergite laterally and apically rather finely and sparsely punctured; third sternite without plica. Uniformly black.

Male

Black; abdomen with very slight deep bluish tint; scutellum (not postscutellum) and pronotal ridge white; tibiae III dorsally with white stripe beyond base; apex of pronotal base rarely white marked; face usually black marked; collare never white; length 12-16 mm. (See also paragraph below concerning variability.)

Flagellum.—With fairly short-oval tyloides on segments 5-16 or 17, the longest not reaching by far bases and apices of segments; basal segments rather stout, seen from the side on which tyloides are situated, the first segment about 1.5 times as long as wide, the following segments about as wide as long. Black; scape ventrally white or white marked.

TABLE I

Distribution of white in 38 *Ctenichneumon excultus* (Cresson) males from Dryden, Maine

38	scape ventrally more or less extensively
14	clypeus uniformly
10	clypeus except a black, median, apical mark
3	clypeus laterally only
38	lateral fields of face
22	median field of face except a black, triangular mark, widened below toward clypeal foveae
8	median field of face except a narrow, short, median line or narrow crossband at base of clypeus
8	median field of face uniformly
21	mark on mandibles
38	pronotal ridge, predominantly or for its whole length
38	subalarum
38	tegulae predominantly or (5) entirely
38	scutellum predominantly or entirely
3	short, median lines on mesoscutum
3	short, lateral lines or small marks on mesoscutum near tegulae
2	small marks on mesosternum at sternauli
2	marks on apex of pronotal base
4	band or mark on apex of prosternum
38	anterior side of femora I, usually except base
38	narrowly at apex of femora II anteriorly
15	small marks apically on coxae I
23	coxae I extensively or predominantly
15	small marks apically on coxae II
18	larger marks apically on coxae II
5	no marks on coxae II
1	ventral mark on coxae III
30	trochanters I ventrally more or less extensively
3	ventral mark on trochanters II
4	ventral mark on trochantelli II
3	ventral mark on trochantelli III
38	tibiae I and II dorsally
38	dorsal stripe of varying length beyond base of tibiae III
34	segments 1-4 or 5 of tarsi I dorsally except apices
4	segments 1-3 of tarsi I dorsally except apices
29	segments 1-4 of tarsi II dorsally except apices
9	segments 1-3 of tarsi II dorsally except apices
20	no white on tarsi III
2	dorsal stripe on segment 1 of tarsi III
10	dorsal stripe on segments 1-3 of tarsi III
5	dorsal stripe on segments 1-4 of tarsi III
1	dorsal stripe on segments 1-5 of tarsi III

Head.—Temple profile scarcely narrowed, with curved outline; malar space about half as long as width of base of mandible. Black; clypeus white with more or less extensive black mark medially at apex, rarely entirely white; lateral fields of face more or less extensively white, usually either triangular mark on median field, or its entire surface black; exceptionally entire face white.

Thorax.—Mesoscutum slightly convex, moderately strongly and not very densely punctured; notauli basally usually distinct; scutellum convex, fairly strongly elevated above postscutellum; area superomedia transverse. Black; the following are white: scutellum (never postscutellum), pronotal ridge, excep-

tionally small mark on apex of pronotal base, always subalarum and tegulae, sometimes collare, exceptionally median and lateral marks on mesoscutum.

Legs.—Black; the following are white: usually marks on apices of coxae I and II, femora I and apex of femora II internally, sometimes femora I and II both internally at apex only, or both for their whole length, tibiae I and II dorsally for their whole length, dorsal stripe on tibiae III beyond base, segments 1 and 2 (sometimes also 3 and 4) of tarsi I dorsally, sometimes also basal segments of tarsi III dorsally.

Abdomen.—Third sternite without, or with incomplete, plica; tergites 2-4 with coarse sculpture, medially longitudinally striate, somewhat shiny. Uniformly black, with a slight dark bluish tint.

Variability

White pattern, especially on face and tarsi, rather variable, as demonstrated by Table I.

3. *Ctenichneumon columbianus*, new species

Types

Holotype.—♀, British Columbia, Robson, 16.VIII.1948, H. R. Foxlee. C.N.C. No. 7256.

Allotype.—♂, British Columbia, Likely, 7.VII.1938, G. S. Walley. C.N.C. No. 7256.

Paratypes.—1 ♀, 1 ♂, Yukon Territory; 2 ♂♂, British Columbia. C.N.C.

Distribution

British Columbia, Yukon Territory (C.N.C.); Alaska (M.C.Z.).

Preamble

A black species, similar to *excultus* (Cresson), from which both sexes differ by the much denser and coarser sculpture of the second and especially the third tergites and by the plica distinctly extending over the third sternite. The female is besides distinguished by having comparatively longer and more slender femora III and a white scutellum. In the male, white pattern on head and legs, including coxae, is generally more restricted than in *excultus* but on tibiae III usually extends over the ventral side too, thus forming a full annulus.

Female

Black, scutellum white; tibiae III with indistinct white mark beyond base on interior side; flagellum with annulus; third sternite with plica; length 15 mm.

Flagellum.—Bristleshaped, attenuated toward apex and acutely pointed, ventrally flattened beyond middle but scarcely widened, with 46 segments, the first about 2.5 times as long as wide, the ninth square. Black with white annulus on segments 6-12.

Head.—Temple and cheek profiles moderately narrowed, the former with slightly curved, the latter with straight outline; malar space about as long as width of base of mandible. Uniformly black.

Thorax.—Mesoscutum slightly convex, rather distinctly and densely punctured, somewhat shiny; notauli obsolete; scutellum moderately raised above postscutellum, gradually sloping to the latter; area superomedia distinctly transverse. Black, scutellum white.

Legs.—Slender; femora III distinctly relatively longer than in *excultus;* coxae III ventrally much more densely and strongly punctured with almost no interval between punctures. Black; anterior side of tibiae I and of apex of femora I ivory; in both known specimens tibiae III beyond base on interior side with an indication of a white mark.

Abdomen.—Median field of postpetiolus well defined, more or less distinctly longitudinally striate, apically grossly punctured; gastrocoeli rather deeply impressed; second tergite strongly and very densely punctured on its entire surface, no interval between punctures, which medially on the base run into irregular, longitudinal striae, opaque; third tergite laterally and apically less strongly and densely punctured, on the basal median part however, almost of the same sculpturing as the second and on the whole much more strongly sculptured than in *excultus.* Uniformly black.

Male

Black, without bluish tint; scutellum and apical part of pronotal ridge (but not postscutellum) white; tibiae III usually with white annulus beyond base; only lateral fields of face and clypeus white; collare not white; length 17-19 mm.

Flagellum.—With 44-45 segments and with fairly short, narrow-oval tyloides on segments 5 or 6 to 18. Black; scape rarely ventrally white marked.

Head.—Temple profile slightly narrowed with slightly curved outline; malar space about half as long as width of base of mandible. Black; stripe on facial orbits and lateral marks on clypeus white.

Thorax.—Mesoscutum convex, much more strongly and densely punctured than in *excultus;* notauli obsolete; scutellum convex and fairly strongly elevated above postscutellum; area superomedia transverse. Black; the following are white: scutellum, apex of pronotal ridge more or less extensively, subalarum, sometimes mark on tegulae.

Legs.—Black; the following are white: apex of femora I on anterior side, tibiae I dorsally, tibiae II dorsally except apex (the black stripe on ventral side sometimes greatly reduced), annulus beyond base of tibiae III (in the type specimen reduced to a small, dorsal mark), in one specimen a small, apical mark on coxae I; tarsi I varying from ferruginous to whitish.

Abdomen.—Third sternite with plica; postpetiolus strongly, irregularly rugose or irregularly striate; tergites 2-4 very densely and coarsely punctured, almost opaque. Uniformly black without any bluish tint.

4. *Ctenichneumon minor*, new species

Types

Holotype.—♀, New York, Richfield Springs, 9.IX.1952, Gerd H. Heinrich. C.G.H.

Allotype.—♂, Maine, Dryden, 13.VIII.1952, Gerd H. Heinrich. C.G.H.

Paratypes.—1 ♀, New York, Ithaca; 1 ♀, Nova Scotia, MacNab's Island; 4 ♂♂, Ontario, Merivale and Ingersoll; 4 ♂♂, New Brunswick, Bathurst and Kings Co. C.N.C. No. 7233. 5 ♂♂, Maine, Dryden and Rockwood. C.G.H. 1 ♀, West Virginia, Cranberry Ils, U.S.N.M.

Distribution

New York, Ontario, New Brunswick, Nova Scotia, Quebec, Saskatchewan, Manitoba (C.N.C.). Connecticut (M.C.Z.); Maine (C.G.H.). West Virginia (U.S.N.M.).

Preamble

A constantly fairly small, black species, well distinguished in both sexes by the very densely punctured, nearly opaque mesoscutum and the broad, white annulus on tibiae III.

Female

Black, scutellum white; tibiae II and III with broad, white annulus, tibiae I almost entirely white; flagellum with unusually extensive white annulus which dissolves into a row of white marks, often continuous toward the base of the first segment; fourth sternite without plica; length 11-12 mm.

Flagellum.—Bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally flattend beyond middle and slightly widened, with about 40 segments, the first fully 2.5 times as long as wide, the tenth square, the widest about 1.5 times as wide as long. Black with unusually extensive white annulus which is gradually reduced on the basal segments to a row of white apical marks and, including these disconnected white spots, often reaches from the first to the eleventh segment.

Head.—Temple profile moderately, cheek profile more distinctly narrowed, the former with curved, the latter with straight outline; malar space slightly longer than width of base of mandible. Black.

Thorax.—Mesoscutum scarcely convex, fairly finely but densely punctured, nearly opaque; notauli obsolete or slightly indicated at base; scutellum somewhat raised above postscutellum, gradually sloping toward the latter, dorsally distinctly convex; area superomedia square or slightly wider than long. Black, scutellum white.

Legs.—Moderately slender. Black; the following are white: broad annulus on tibiae II and III, tibiae I dorsally entirely, apex of femora on interior side narrowly; tarsi blackish-brown.

Abdomen.—Median field of postpetiolus longitudinally striate, usually with a few scattered punctures toward apex; second and third tergites (the latter except apex) densely and strongly punctured; punctures on basal part of middle of second tergite running into more or less pronounced, longitudinal striae; fourth sternite without plica. Uniformly black.

Male

Black, scutellum, postscutellum and pronotal ridge white; scape ventrally not white; tibiae III with broad, full, white annulus; mesoscutum very densely punctured, nearly opaque; basal segments of flagellum relatively longer than in excultus *(Cresson); length 11-13 mm.*

Flagellum.—With bacilliform tyloides on segments 5-16; segments 1-4 relatively distinctly longer than in *excultus* male, the first fully twice as long as wide, the second to fourth distinctly longer than wide. Uniformly black including scape, the latter never ventrally white marked.

Head.—Temple profile moderately narrowed with curved outline; malar space little more than half as long as width of base of mandible. Black; lateral fields of face and clypeus laterally more or less extensively, exceptionally entirely white.

Thorax.—Mesoscutum fairly strongly convex, very densely punctured, nearly opaque; notauli basally distinct or indicated; scutellum strongly raised above postscutellum, strongly convex; area superomedia transverse. Black; the following

are white: collare, pronotal ridge, subalarum, tegulae, scutellum, postscutellum and usually a mark on apex of pronotal base.

Legs.—Coxae densely and strongly punctured. Black; the following are white: inner side of femora I, apex of femora II narrowly on inner side, tibiae I and II (except a black stripe on apical part of ventral side), tibiae III, except the narrowly black base and the broadly black apex, segments 1, or 1 and 2 of tarsi I and often also metatarsus II dorsally.

Abdomen.—All tergites very densely punctured; sculpture on tergites 1-3 extremely coarse and dense, on the middle of first and second tergites usually strongly, irregularly, reticulate-rugose; anterior tergites sharply separated from one another. Uniformly black.

5. *Ctenichneumon holomelas*, new species

Types

Holotype.— ♀, Manitoba, Cedar Lake, July, 1936. C.G.H.

Distribution

Manitoba.

Preamble

A black species, superficially similar to *excultus* (Cresson), but very distinctly differing by much stouter basal flagellar segments, and in lateral view much wider femora III which are stouter than in all other known American species.

Female

Uniformly black, without bluish tint, including scutellum and flagellum; sculpture of anterior tergites comparatively fine; femora III very wide; flagellum short with stout basal segments; length 13 mm.

Flagellum.—Fairly short, bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally distinctly flattened beyond middle and somewhat widened, with 39 segments, the first about 1.5 times as long as wide, the third square, the widest 1.5 times as wide as long. Black, without annulus.

Head.—Temple profile scarcely narrowed with curved outline; cheek profile distinctly narrowed, with straight outline; malar space scarcely longer than width of base of mandible. Uniformly black.

Thorax.—Mesoscutum almost flat, very finely and sparsely punctured, very shiny; scutellum flat, not raised above postscutellum; area superomedia square. Uniformly black.

Legs.—Stout; femora III in lateral view wider than in all other known American species of this genus, not much more than three times as long as medially wide; coxae III ventrally shiny, finely and moderately densely punctured. Black; tibiae I and II, tarsi I and II and tibiae III toward base brownish.

Abdomen.—Postpetiolus finely, longitudinally striate, with few scattered punctures at apex; gastrocoeli fairly deeply impressed, thyridia comparatively distinct; second tergite distinctly, but moderately densely, punctured, without median striation; third tergite more finely, and apically as well as laterally, less densely punctured. Uniformly black.

6. *Ctenichneumon semicaeruleus* (Cresson)

Ichneumon semicaeruleus Cresson, 1867, Amer. Ent. Soc. Trans., 1:302, ♀.

Types

Holotype.– ♀, Virginia. A.N.S.

Neallotype.– ♂, Maine, Dryden. C.G.H.

Distribution

According to H. Townes 1951: "Atlantic to Iowa in Transitional and Upper Austral Zones". New records: Manitoba, Alberta (C.N.C.).

Female

Head, thorax, first segment and coxae metallic blue; tergites 2-7 vivid red; frontal orbits, apex of pronotal ridge and usually scutellum white; legs black; flagellum with white annulus; length 11-13 mm.

Flagellum.–Bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally flattened beyond middle, but scarcely widened, with 41-43 segments, the first approximately 2.5 times as long as wide, the sixth or seventh square, the widest slightly wider than long. Black, segments 6 or 7 to 13 or 16 with white annulus.

Head.–Temple profile moderately narrowed with slightly curved outline, cheek profile more considerably narrowed with nearly straight outline; malar space a little longer than the width of base of mandible. Metallic blue; frontal orbits and the uppermost part of facial orbits usually white.

Thorax.–Mesoscutum slightly convex, finely and moderately densely punctured; notauli obsolete; scutellum but slightly raised above postscutellum. Metallic blue; collare, apex of pronotal ridge and usually scutellum (entirely or partially) white.

Legs.–Moderately slender. Black; coxae dark metallic blue; apex of femora I and tibiae I ivory on anterior side.

Abdomen.–Gastrocoeli fairly deeply impressed; thyridia subobsolete. First segment more or less distinctly metallic blue tinted; tergites 2-7 uniformly red.

Male

Dark metallic blue including abdomen; scutellum and other parts white; length 12-14 mm.

Flagellum.–With elongate, bacilliform tyloides on segments 4 or 5 to 16 or 17, the longest on about 8th-14th segments reaching nearly from bases to apices of segments. Black; scape ventrally white marked.

Head.–Dark metallic blue; the following are white: mandibles except teeth, clypeus face and frontal orbits; median field of face often black marked or black, middle of clypeus sometimes black (especially in western specimens).

Thorax.–Dark metallic blue; the following are white: collare, pronotal ridge, subalarum, tegulae, scutellum (usually except base).

Legs.–Black; the following are white: ventral-apical marks on coxae I and usually also on coxae II, ventral marks on trochanters I and II, frontal side of femora I and of apex of femora II, tibiae and tarsi I and II dorsally, longitudinal stripe on exterior side of tibiae III from shortly beyond base to beyond middle.

7. *Ctenichneumon caeruleops*, new species

Types

Holotype.– ♀, Saskatchewan, Saskatoon, 9.VII.1949, H. McDonald. C.N.C. No. 7255.

Allotype.– ♂, Saskatchewan, Saskatoon, 9.VII.1949, H. McDonald. C.N.C.
Paratypes.–2 ♀♀, 1 ♂, Saskatchewan; 1 ♀, 1 ♂, British Columbia. C.N.C.; 4 ♀♀, 3 ♂♂, British Columbia, Robson. C.G.H.

Distribution

Saskatchewan, British Columbia.

Preamble

Closely related to *semicaeruleus* but constantly considerably larger, and females without white pattern on head and thorax (except sometimes a small white mark on facial orbits). Head and mesoscutum of females less distinctly bluish tinted than in *semicaeruleus*, femora III relatively a little longer. It almost seems to suggest that this is the western subspecies of *semicaeruleus*, but the constant, considerable difference in size, which indicates a specialization on different hosts and thus an important biological differentiation, makes such a hypothesis somewhat doubtful. Furthermore it seems that the ranges of both forms overlap rather widely in western Canada, as *semicaeruleus* has been recorded as far west as Alberta, *caeruleops* eastward to Saskatoon. Present records are, however, too scarce to permit definite conclusions.

Female

Head, thorax, first segment and coxae with dark, metallic blue tint which is on mesoscutum, head and coxae less distinct than in semicaeruleus; *frontal orbits, pronotal ridge and scutellum without white pattern; tergites 2-7 red; legs black; flagellum usually with white annulus; length 14-15 mm.*

Flagellum.–Bristleshaped, considerably attenuated and acutely pointed at apex, ventrally flattened beyond middle and slightly widened, with 43-46 segments, the first nearly 2.5 times as long as wide, the seventh or eighth square, the widest nearly 1.5 times as wide as long. Black with white annulus on segments 6, 7 or 8 to 11, 12 or 13, rarely without white annulus.

Head.–Temple profile a little more distinctly narrowed than in *semicaeruleus* with but slightly curved outline, cheek profile considerably narrowed with straight outline; malar space about as long as width of base of mandible. Black with a slight, dark metallic blue tint; sometimes a white mark on upper facial orbits, level with antennal sockets.

Thorax.–Mesoscutum slightly convex, rather finely and sparsely punctured, shiny; notauli obsolete; scutellum usually scarcely raised above postscutellum, dorsally flat, gradually slanting to the postscutellum. Dark metallic blue, the mesoscutum and scutellum less distinctly bluish tinted than the rest; pronotal ridge and scutellum without white pattern.

Legs.–Moderately slender; femora III relatively a little longer than in *semicaeruleus*. Black, coxae sometimes with slight bluish tint; apex of femora I and the tibiae I ivory on anterior side; tibiae II and III sometimes brownish toward base.

Abdomen.–Gastrocoeli deeply impressed; postpetiolus more or less distinctly longitudinally striate with more or less dense puncturation at apex; plica on sternites 1-2 or 3. First segment black, more or less distinctly metallic blue tinted; tergites 2-7 uniformly red.

Male

Very similar to *semicaeruleus* but considerably larger; head, mesoscutum and coxae less distinctly blue; median field of face, frontal orbits, scape ventrally and anterior part of pronotal ridge not white.

Dark metallic blue including abdomen; scutellum and other parts white; length 17-18 mm.

Flagellum.—With 45-46 segments and elongate, bacilliform tyloides on segments 4 or 5 to 19 or 20, the longest reaching nearly from bases to apices of segments. Black including scape.

Head.—Black, scarcely bluish tinted; the following are white: sides of clypeus (sometimes clypeus predominantly), lateral fields of face, mark on mandibles (type).

Thorax.—Dark metallic blue, mesoscutum scarcely bluish tinted; the following are white: usually collare, pronotal ridge except base or apically only, subalarum, tegulae partially, rarely entirely, and scutellum (usually except base).

Legs.—Black, coxae but slightly bluish tinted; the following are white: usually ventral mark on coxae I, sometimes also on coxae II, trochanters I ventrally usually at apex, sometimes more extensively, usually exterior mark on trochanters II, usually ventral mark on trochantelli I, rarely also on trochantelli II, anterior side of femora I, apex of femora II on anterior side, tibiae I and II dorsally, dorso-lateral stripe beyond base of tibiae III, tarsi I and II dorsally except apices of segments narrowly and except the last segment (dorsally only or sometimes partially also on ventral side), sometimes dorsal longitudinal stripes on several segments of tarsi III.

Abdomen.—Uniformly metallic blue.

8. *Ctenichneumon punctiscuta*, new species

Types

Holotype.—♀, Manitoba, Aweme, 4.X.1923, N. Criddle. C.N.C. No. 7257.

Paratype.—1 ♀ (lacks flagella), British Columbia, Agassiz, 4.X.1913. C.N.C.

Distribution

Manitoba, British Columbia.

Preamble

The existence of a third species with metallic blue head and thorax and red abdomen is surprising. But I can not doubt its distinction. *Ctenichneumon punctiscuta* agrees in its small size and bright blue color of head and thorax with *semicaeruleus* (Cresson), in both these characters differing from *caeruleops*, new species. It differs from *semicaeruleus* distinctly by its strongly narrowed temple profile and from both mentioned species by the mesoscutum and scutellum being strongly and rather densely punctured. See also preamble of *ruidosensis* (Cockerell).

Female

Head, thorax (including scutellum), first segment and coxae intensively metallic blue; tergites 2-7 vivid red; no white markings except sometimes a small, white spot on the apex of pronotal ridge; legs black, femora III in the paratype red; flagellum with white annulus; mesoscutum and scutellum strongly and rather densely punctured; temple profile considerably narrowed; length 11-12 mm.

Flagellum.—Bristleshaped, considerably attenuated toward apex and acutely pointed, ventrally distinctly flattened beyond middle and slightly widened, with 43 segments, the first nearly 2.5 times as long as wide, about the eighth square, the widest 1.5 times as wide as long. Black with white annulus on segments 6-13.

Head.—Temple profile and cheek profile considerably narrowed, with nearly straight outlines; temple profile distinctly more narrowed than in *semicaeruleus;*

malar space scarcely longer than width of base of mandible. Uniformly intensively metallic blue.

Thorax.—Mesoscutum and scutellum slightly convex, the latter somewhat raised above postscutellum, both strongly and rather densely punctured; notauli obsolete; area superomedia transverse. Intensively metallic blue, without white markings in the paratype, with a small white dot on apex of pronotal ridge in the type.

Legs.—Slender; coxae III fairly strongly and densely punctured. Black; coxae metallic blue; tibiae I and apex of femora I both ivory on anterior side; femora III slightly purplish tinted in the type, red in the paratype.

Abdomen.—Gastrocoeli rather deeply impressed; third sternite with plica; median field of postpetiolus longitudinally striate, or (in paratype) rugose, with scattered punctures at the apex; second tergite moderately strongly and on the disc fairly densely punctured, punctures in the middle running into longitudinal striae; third tergite a little less strongly and densely punctured. Tergites 2-7 vivid red; the first segment intensively deep metallic blue.

9. *Ctenichneumon ultus* (Cresson)

Ichneumon ultus Cresson, 1867, Amer. Ent. Soc. Trans., 1:295, ♂.
Ichneumon rogalis Cresson, 1867, Amer. Ent. Soc. Trans., 1:295, ♂.

Types

Holotypes.—Ichneumon ultus Cresson, ♂, Virginia. A.N.S.; *Ichneumon rogalis* Cresson, ♂, Virginia. A.N.S.

Neallotype.— ♀, Maine, Dryden, 26.VI.1952. C.G.H.

Distribution

According to H. Townes 1951: "Quebec to South Carolina".

Preamble

The type specimen of *ultus* has a black abdomen; this is, however, evidently a dichromatic species as in Maine and Quebec an erythristic phase fairly often occurs with an entirely red abdomen, which is not linked by intergrades with the melanistic phase of the type. A tendency for such dichromatism seems to represent a character of the genus, as two European species, *Ctenichneumon edictorius* (Thunberg) and *messorius* Gravenhorst also occur regularly in an erythristic and a melanistic phase. *Ctenichneumon ultus* is the largest of the males of eastern North America. Consequently, I have associated with it the largest of the females occurring in the same region.

Male

Black; scutellum, pronotal ridge partially and usually postscutellum white; abdomen either uniformly black (without bluish tint) or uniformly red, except first tergite; tibiae III with broad, white annulus beyond base; wings not infuscated; mesoscutum moderately densely punctured, shiny; flagellar segments very stout, becoming gradually more and more strongly transverse beyond the sixth; length 15-19 mm.

Flagellum.—With 43-49 segments and with short, oval tyloides on segments 5 or 6 to 19, 20 or 21, which nearly reach the bases but by far not the apices of segments; segments short, seen from the side of row of tyloides the sixth about as wide as long, segments beyond the seventh becoming gradually more and more distinctly wider than long. Black; scape ventrally white.

Head.—Temple profile scarcely narrowed, with curved outline; malar space about half as long as width of base of mandible. Black; clypeus usually white except apical border or apical half, sometimes medially black, laterally white; lateral fields of face always white, frontal orbits never; median field of face usually entirely black or with small white marks only, sometimes predominantly white with black, median mark or abbreviated, narrow, black, median line; mandibles medially ferruginous, sometimes obscure yellowish.

Thorax.—Mesoscutum somewhat convex, fairly strongly and not very densely punctured, shiny; notauli obsolete; scutellum fairly wide, moderately convex, comparatively little elevated above postscutellum; area superomedia transverse. Black; the following are always white: collare, subalarum, tegulae, pronotal ridge apically, scutellum, usually also the postscutellum; white pattern on pronotal ridge wedge-shaped, wide at tegulae, pointed anteriorly, the narrowed anterior part sometimes prolonged over almost the whole length of pronotal ridge; exceptionally mesoscutum laterally near tegulae with small white mark.

Legs.—Black; the following are white: more or less extensive marks on apices of coxae I and II, usually a ventral mark near apex of coxae III, which is usually connected with a white dorso-lateral, longitudinal band, often trochanters I ventrally at apex or more extensively, often ventral marks on trochanters II and on trochanters II and on trochantelli III, sometimes also trochantelli I and II, always tibiae I and II except a wedge-shaped stripe ventrally toward apex, annulus on tibiae III beyond base (which exceptionally may be restricted to a dorsal stripe), tarsi I and II entirely or except last segments (but in contrast to *excultus* (Cresson) and *gracilior*, new species, always including apices of segments), sometimes segments 1, or 1 and 2, or 1-3 of tarsi III except bases and apices, dorsally only or also ventrally.

Abdomen.—Third sternite without or with incomplete plica; second and third tergites with coarse sculpture, densely and strongly punctured, punctures running into longitudinal striae between gastrocoeli and on the middle of tergites, sides of the latter more sparsely punctured and somewhat shiny. Rufous, except the black first segment, or entirely black, the last tergite often partially or entirely obscure ferruginous.

Female

Extremely similar to *townesi*, new species, from which it can be distinguished only by subtle differences in sculpture of anterior tergites and of coxae, by the third sternite usually lacking a distinct plica, by the imperceptibly more slender flagellum and by the black subalarum.

Wings strongly infuscated; black, including legs, subalarum and, with very rare exceptions, the entire scutellum; tergites 2-7 rufous; tergites 2 and 3 fairly finely and sparsely punctured, shiny, base of second tergite medially without or with a few short, rather indistinct striae; third sternite without complete plica; widest segment of flagellum scarcely wider than long; length 15-17 mm.

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally distinctly flattened beyond middle, but scarcely widened, with 46-50 segments, the first about twice as long as wide, about the ninth square, the widest scarcely wider than long. Black, with white annulus on segments 5 or 6 to 14 or 15.

Head.—Temple profile slightly, cheek profile distinctly narrowed, the former with curved, the latter with almost straight outline; malar space about as long as width of base of mandible. Black; exceptionally vertical orbits with an obscure, ferruginous mark.

TABLE II

Distribution of white and red in 14 *Ctenichneumon ultus* (Cresson) males from Dryden, Maine

	a. white
14	scape ventrally more or less extensively
10	clypeus except apical border or (2) apical half
3	sides of clypeus and narrowly its base
1	clypeus laterally only
14	lateral fields of face
1	median field of face except a black triangular mark widened below toward clypeal fovae
3	median field of face except a short, narrow median line
5	two small dots or one median mark on face only
5	median field of face entirely black
9	apex or apical third of pronotal ridge
5	nearly whole length of pronotal ridge (broadly at apex, narrowly toward base)
14	collare
14	subalarum
14	tegulae
14	scutellum entirely
11	postscutellum
1	lateral marks on mesoscutum near tegulae
14	anterior side of femora I, usually except base
8	anterior side of femora II predominantly
6	narrowly at apex of femora II anteriorly
1	small marks apically on coxae I
13	coxae I extensively
1	small marks apically on coxae II
13	coxae II extensively
11	ventral mark on coxae III
10	dorso-lateral stripe on coxae III (usually connected with ventral mark)
8	trochanters I ventrally, usually at apex, or sometimes more extensively
6	ventral mark on trochanters II
3	ventral marks on trochantelli I and II
6	ventral mark on trochantelli III
14	tibiae I and II except wedge-shaped stripe ventrally toward apex
13	annulus beyond base of tibiae III
1	dorsal stripe beyond base of tibiae III
14	tarsi I and II, sometimes except last segment
8	no white on tarsi III
1	dorsal stripe on segment 1 of tarsi III
2	dorsal stripe on segments 1-2 of tarsi III
3	dorsal stripe on segments 1-3 of tarsi III
	b. red
9	tergites 2-7 red
2	tergite 7 brown, rest of abdomen black
2	tergite 7 partially brown, rest of abdomen black
1	abdomen uniformly black

Thorax.—Mesoscutum slightly convex, moderately densely and strongly punctured, shiny; notauli obsolete; scutellum little raised above postscutellum, slightly convex; area superomedia transverse. Black, including scutellum and subalarum, exceptionally the former partially or even entirely white.

Legs.—Moderately slender; coxae III ventrally shiny, moderately strongly and moderately densely punctured, spaces between punctures somewhat wider than punctures. Black, apex of femora I and the tibiae I ivory on interior side.

Abdomen.—Median field of postpetiolus finely, sometimes indistinctly longitudinally striate, with some scattered punctures near the apex; second and third

tergites moderately strongly and fairly sparsely punctured, shiny, without longitudinal striation, or with some weak, short striae in the middle between gastrocoeli; third sternite without or with incomplete plica. Rufous, except the black first segment, the postpetioles sometimes indistinctly reddish tinted at the very apex.

10. *Ctenichneumon townesi*, new species

Types

Holotype.– ♀, Michigan, Ann Arbor, 29.VI.1959, H. & M. Townes. C.H.T.

Allotype.– ♂, Michigan, Ann Arbor, 21.VI.1959, H. & M. Townes. C.H.T.

Paratypes.–1 ♀, 9 ♂♂, Michigan, Ann Arbor. C.H.T.; 1 ♀, 4 ♂♂, New York, Ithaca. C.N.C. No. 7253; 1 ♂, New York, Ithaca; 1 ♂, Michigan, Ann Arbor; 1 ♀, Maine, Augusta. C.G.H.

Distribution

Michigan, New York, Maine.

Preamble

By its dark wings and legs combined with red abdomen the male is well distinguished and rather different in appearance from all other eastern species. In 1959 H. Townes caught a broad series of males by trap and along with these in the same period of time and at the same place two females which obviously are to be associated with the males. These females are, however, so extremely similar to *ultus* (Cresson) that I certainly would not have dared to consider them as representatives of a distinct species, had it not been for their association with the so-well-distinguished males. The differences between females of *ultus* and *townesi* are mentioned in the treatment of the former species.

Female

Wings strongly infuscated; black including legs and usually the entire scutellum; subalarum white; tergites 2-7 rufous; tergites 2 and 3 distinctly and rather densely punctured, the second nearly opaque and medially fairly strongly and extensively longitudinally striate; third sternite with distinct plica; widest segment of flagellum nearly 1.5 times as wide as long; length 14-16 mm.

Flagellum.–Not quite as slender as in *ultus;* bristleshaped, extremely attenuated and acutely pointed at apex, ventrally distinctly flattened beyond middle and slightly widened, with 44-48 segments, the first about twice as long as wide, about the sixth square, the widest nearly 1.5 times as wide as long. Black, with white annulus on segments 5 (apex) or 6 to 13.

Head.–As in *ultus.* Black.

Thorax.–As in *ultus.* Black; subalarum partially white; sometimes scutellum white marked.

Legs.–Moderately slender; coxae III ventrally less shiny and distinctly more densely punctured than in *ultus.* Color as in *ultus.*

Abdomen.–Median field of postpetiolus more sharply defined than in *ultus,* more strongly and regularly longitudinally striate; second and third tergites somewhat stronger and denser punctured than in *ultus,* the second almost opaque and medially distinctly and more extensively striate than in *ultus;* third sternite with distinct plica. Rufous except the black first segment.

Male

Single eastern male with strongly infuscated wings; black, abdomen rufous except first segment; subalarum always, scutellum in majority of specimens,

predominantly white or white marked; apex of pronotal ridge usually with a small white mark; legs black including coxae and trochanters; all tibiae with white pattern which on tibiae III are often restricted to a dorso-external mark or exceptionally entirely replaced by black; length 16-17 mm.

Flagellum.—With 43-48 segments and oval, fairly short tyloides on segments 6-18; segments less abbreviated than in *ultus*. Black, scape ventrally white or at least white marked.

Head.—Temple profile scarcely narrowed with curved outline; malar space about half as long as width of base of mandible. Black; the following are white: clypeus usually except more or less extensive apico-median mark, sometimes its sides only, lateral fields of face entirely or predominantly, median fields of face to a varying extent, rarely entirely, sometimes partially; often median field of face entirely black.

Thorax.—Scutellum more strongly raised above post-scutellum than in female. Black; subalarum entirely or partially, scutellum in majority of specimens predominantly white or white marked; usually small white mark on apex of pronotal ridge; tegulae usually black, sometimes white marked, rarely entirely white.

Legs.—Black; the following are white: anterior side of femora I more or less extensively, usually predominantly (the light color usually pale rufous tinted toward base, clearer white toward apex of femora), sometimes apex of femora II on anterior side narrowly, tibiae I on anterior side entirely, and dorsally from beyond base to near apex, dorsal stripe beyond base of tibiae II, short dorsal stripe

TABLE III

Distribution of white in 15 *Ctenichneumon townesi*, new species, males from Michigan and New York

15	scape ventrally more or less extensively
9	clypeus except apico-median mark
6	clypeus laterally only
15	lateral fields of face predominantly or entirely
1	median field of face entirely
2	median field of face except short, narrow, median line and lateral lines
3	median field of face except triangular mark, widened below toward clypeal foveae
4	two small marks on median field only
5	median field entirely black
15	subalarum entirely or partially
9	mark on apex of pronotal ridge
2	tegulae predominantly
4	mark on tegulae
9	tegulae entirely black
10	scutellum entirely, or entirely except basal band
3	mark on scutellum of varying size
2	scutellum black
15	femora I on anterior side (usually pale rufous rather than white)
4	apical mark on anterior side of femora II
15	tibiae I on anterior side and dorsally beyond base
14	dorsal stripe or mark beyond base on tibiae II
1	annulus beyond base on tibiae II
11	dorsal mark or short stripe beyond base on tibiae III
3	annulus beyond base of tibiae III
1	tibiae III black
1	minute dots on apex of coxae I and II

or small mark beyond base of tibiae III, sometimes extending also over the ventral side, thus forming a full annulus; exceptionally tibiae III entirely black or coxae I and II with a small, apical white dot.

Abdomen.—Median field of postpetiolus sharply defined, fairly strongly, often irregularly, longitudinally striate with scattered punctures at apex; tergites 2-4 tensely sculptured, second and third opaque, the fourth nearly so; middle of second tergite strongly, longitudinally striate. Rufous, except the black first segment.

11. *Ctenichneumon rufibasis*, new species

Types

Holotype.—♀, Maine, Dryden, 6.VIII.1959, Gerd H. Heinrich. C.G.H.

Paratypes.—1 ♀, Maine; 1 ♀, Quebec. C.G.H.; 4 ♀♀, Quebec. C.N.C. No. 7253.

Distribution

Maine, Quebec.

Preamble

A smaller species, related to *ultus* (Cresson), *gracilior*, new species, and *townesi*, new species, differing from all three by a shorter and somewhat stouter flagellum, the somewhat shorter femora III and by the red first segment. Differing furthermore from *ultus* by the stronger sculpture of second tergite and the plica extending over the third sternite, from *gracilior* by the same stronger sculpture of second tergite and also by the less densely and strongly punctured coxae III, from *townesi* by the only slightly infuscated wings and the black subalarum.

Female

Wings slightly or not infuscated; black, including legs, subalarum and usually scutellum; abdomen red including the first tergite; second tergite densely and fairly strongly punctured, longitudinally striate in the middle, the third less densely and strongly sculptured, except basally; third sternite with distinct plica; widest segment of flagellum about 1.5 times as wide as long; length 12-14 mm.

Flagellum.—Bristleshaped, considerably attenuated and acutely pointed at apex, ventrally distinctly flattened beyond middle and slightly widened, with 39-43 segments, the first less than twice as long as wide, the fifth square, the widest nearly 1.5 times as wide as long. Black with wide white annulus on segments 4-11 or 12.

Head.—Temple profile slightly, cheek profile distinctly narrowed, the former with curved, the latter with almost straight outlines; malar space scarcely longer than width of base of mandible. Black; clypeus in all but one of the known specimens predominantly ferruginous, frontal orbits usually narrowly ferruginous.

Thorax.—Mesoscutum nearly flat, finely and not densely punctured; notauli obsolete; scutellum somewhat raised above postscutellum, dorsally slightly convex; area superomedia square or a little wider than long. Black; in one specimen scutellum white marked.

Legs.—Moderately stout; femora III relatively a little shorter and stouter than in *ultus* and *townesi;* coxae III ventrally finely and not very densely punctured, shiny. Black; tibiae I and the very apex of femora I ivory on anterior side.

Abdomen.—Median field of postpetiolus clearly defined and clearly longitudinally striate; gastrocoeli rather deeply impressed; sculpture of anterior tergites coarser than in *ultus* and *gracilior;* second tergite strongly and densely punctured, medially longitudinally striate, the third medially in basal half also fairly strongly and densely punctured, usually with some weak striation basally. Uniformly red, including at least the postpetiolus, usually the entire first segment.

12. *Ctenichneumon gracilior*, new species

Types

Holotype.— ♀, Maine, Dryden, 25.VI.1955, Gerd H. Heinrich. C.G.H.

Allotype.— ♂, Maine, Weld, June, 1960, Gerd H. Heinrich. C.G.H.

Paratypes.—7 ♀ ♀, Maine, Dryden and Augusta; 2 ♂ ♂, Maine, Dryden and Mt. Blue. C.G.H. 1 ♀, Quebec, Hemmingford. C.N.C. No. 7252.

Distribution

Maine, Quebec.

Preamble

The female of this species is rather well distinguished by its comparatively slender, slightly elongate abdomen with lack of longitudinal striation or reticulation on the second tergite, furthermore chromatically by its white scutellum, red abdomen and clear wings. The male, associated below, has a black abdomen and is rather similar to *excultus* (Cresson) from which it differs as a distinct species mainly by the sculpture of tergites 2-4, which are very densely punctured and opaque but lack entirely the median, longitudinal striation typical for *excultus.* These tergites are also narrower and slightly more elongate, thus corresponding well with the female. The more slender flagellum with less abbreviated segments differs obviously from *syphax* (Cresson) and *ultus* (Cresson) males.

Female

Head and thorax black, scutellum and narrow frontal orbits white; abdomen red except first segment; legs black; second and third tergites shiny, without coarse sculpture, the second somewhat longer than apically wide, the third but little wider than long; flagellum slender; length 13-15 mm.

Flagellum.—Bristleshaped, extremely attenuated and acutely pointed at apex, ventrally distinctly flattened beyond middle but scarcely widened, with 43-45 segments, the first fully 2.5 times as long as wide, about the ninth square, the widest about 1.3 times as wide as long. Black with white annulus on segments 5 or 6 to 12.

Head.—Temple and cheek profiles distinctly narrowed, the former with but slightly curved, the latter with rather straight outlines; malar space about as long as the width of base of mandible. Black; frontal orbits up to level of lower ocellus narrowly white, sometimes upper part of facial orbits obscure ferruginous.

Thorax.—Mesoscutum slightly convex, moderately densely punctured; notauli basally indicated; scutellum somewhat raised above postscutellum, gradually declivous toward the latter, dorsally slightly convex; area superomedia usually a little narrowed toward base and somewhat wider than long. Black; scutellum predominantly or entirely white; exceptionally collare obscure reddish or subalarum with a white dot.

Legs.—Slender; coxae III very distinctly and very densely punctured (more densely than in all related species of eastern North America). Black; apex of femora I and the tibiae I ivory on anterior side.

Abdomen.—Slender, slightly elongate; median field of postpetiolus finely, longitudinally striate, toward apex more or less densely punctured; third sternite without plica; second and third tergites distinctly, but fairly sparsely, punctured, shiny, without longitudinal striation (except sometimes some very short striae between gastrocoeli); second tergite distinctly longer than apically wide, the third but little wider than long. Red; first segment black, exceptionally apex of postpetiolus obscure reddish.

Male

Black, including abdomen, without any bluish tint; scutellum (not postscutellum) and pronotal ridge white; tibiae III dorsally with long, white stripe from the very base to beyond middle; entire face, collare and frontal orbits white; flagellum slender, seen from side of tyloides the fourth and fifth segments distinctly longer than wide; tergites 2-4 densely punctured, opaque but without longitudinal striation; length 15-16 mm.

Flagellum.—More slender with more elongate segments and narrower tyloides than in *syphax* and *ultus;* with 40-41 segments and longish-oval, narrow tyloides on segments 5 or 6 to 17 or 18; segments beyond middle in lateral view opposite row of tyloides not distinctly transverse as in *ultus.* Black, scape ventrally white.

Head.—Black; the following are white: mandibles except teeth, clypeus (sometimes except small, black mark on the middle of apical border), face entirely, frontal orbits up to level of lower ocellus.

Thorax.—Mesoscutum fairly densely punctured; area superomedia wider than long. Black; the following are white: collare, pronotal ridge broadly, subalarum, tegulae and scutellum.

Legs.—Slender; coxae III ventrally more strongly and densely punctured than in all related species. Black; the following are white: coxae I and II extensively, usually large marks on coxae III ventrally near apex; trochanters I or I and II ventrally in part, all trochantelli ventrally, anterior side of femora I, apex of femora II anteriorly, entire dorsal side of tibiae I and II, long dorsal stripe on tibiae III which (in contrast to *excultus*) begins at the very base and extends to beyond middle, all tarsi dorsally except apices narrowly of segments of tarsi II and tarsi III and the last segment of tarsi III and sometimes of tarsi II.

Abdomen.—Postpetiolus coarsely punctured, rugose; second to fourth tergites very densely punctured, nearly opaque, without median, longitudinal striation, except sometimes a little pronounced longitudinal rugosity at the base of second tergite between gastrocoeli.

13. *Ctenichneumon syphax* (Cresson)

Ichneumon syphax Cresson, 1864, Ent. Soc. Phila. Proc., 3:181, ♀.
Ichneumon rufizonatus Cresson, 1864, Ent. Soc. Phila. Proc., 3:184, ♀.
?*Ichneumon electus* Cresson, 1867, Amer. Ent. Soc. Trans., 1:304, ♂.
?*Ichneumon nitidus* Provancher, 1875, Nat. Canad., 7:24, 79, ♂.
Ichneumon Marianapolitanensis Provancher, 1875, Nat. Canad. 7:24, 81, ♀.
Amblyteles rufizonatus Townes, 1951, Syn. Cat., p. 295, ♀.
Amblyteles rufizonatus Walkley, 1958, Syn. Cat., First Suppl., p. 50, ♀.
Ctenichneumon syphax Heinrich, 1959, Ent. News, p. 210, ♀.

Types

Holotypes.—*Ichneumon syphax* Cresson, ♀, Delaware. A.N.S.; *Ichneumon rufizonatus* Cresson, ♀, New Jersey. A.N.S.; *Ichneumon electus* Cresson, ♂, Connecticut. A.N.S.; *Ichneumon nitidus* Provancher, ♂, Canada. Provincial

Museum Quebec, No. 653; *Ichneumon Marianapolitanensis* Provancher, ♀, Quebec (Montreal). Provincial Museum, Quebec, No. 649.

Distribution

According to H. Townes 1951: (*syphax*) "Connecticut, New York, Delaware, Ohio, Alberta"; (*rufizonatus*) "Atlantic to 100° West in Canadian Zone and cooler part of Transition Zone"; (*electus*) "Atlantic to 100° West in Transition and Upper Austral Zones."

Preamble

This is, next to *excultus* (Cresson), the most common species of the genus in eastern North America and at the same time the one which presents the greatest number of taxonomic problems. There is first the problem of generic placement. The morphology of the female is not quite typical for *Ctenichneumon*, as the gastrocoeli are too small and shallow and the flagellum is too slender; the ventral plica extending usually over the third sternite excludes neither *Pseudamblyteles* (Ashmead) nor *Ctenichneumon;* the color pattern, however, suggests strongly the latter genus. It is one of the cases where the knowledge of the male will be needed for final confirmation of the generic status of the female. A second problem concerns the limitation of the species. I have synonymized *syphax* and *rufizonatus*, as I feel rather sure that this is a dichromatic species, occurring regularly – at least in the northern parts of its range – in two differently colored phases, the one with segments 2-7 red (*syphax*), the other with only 2-3 red, and with 4-7 black (*rufizonatus*). I found in Maine both forms several times at the same locality and time, about 30% of the populations representing the variety *rufizonatus* with black apical segments.

A third problem is presented by the association of sexes. I suspect that *electus* may be the male of *syphax*. But I am not quite sure yet whether *electus* is at all specifically different from *ultus* (Cresson) or else perhaps a mere color phase of the latter. Both agree in the structure of flagellum, which has the most abbreviated segments of all eastern *Ctenichneumon* species. They also agree in general color pattern, except that *electus* has more extensive white markings, which usually include parts of the propodeum (around the area superomedia) and a predominant part of the upper surface of coxae III. In vain I searched repeatedly for trustworthy morphologic characters which would prove their specific differentiation beyond doubt. It seems that on the average the femora III are somewhat more slender in *electus* than in *ultus* but intergrades occur. Also it seems that the first flagellar segment is relatively a little longer in *electus* than in *ultus*. This difference, however, is too subtle to be of practical usefulness. Nevertheless my impression is that these are two different species. Supposing that this is correct, then I guess that *electus* is the male (and thus a synonym) of *syphax* by four reasons: (1) both species are fairly common and both known until now in only one sex. (2) *electus* is a dichromatic species occurring regularly in two differently colored phases of males, as do the females of *syphax* too. (3) *syphax* female has the most slender femora III of all eastern species. *C. electus* male (together with the male attributed above to gracilior, new species) also has the most slender femora of males. (4) Once I found *electus* males flying fairly frequently over an isolated grassy clearing; the meadow was thoroughly investigated by all members of my family in order to discover the females of *electus*. The sharp eyes of my daughter finally spotted two *Ctenichneumon* females creeping on the ground in the fairly dense stand of grasses; both females turned out to belong to the species *syphax* Cresson.

Summing up, there are theoretically three possibilities: (1) *electus* is a synonym of *ultus;* (2) *electus* is the male of *rufibasis*, new species (making the latter name a synonym); (3) *electus* is the male and a synonym of *syphax.* I have tentatively chosen the latter hypothesis by the reasons mentioned above. It will be the aim of further research to find the truth[2a].

Female

Flagellum long and slender, first segment three times as long as wide; head, thorax and legs black, sometimes clypeus and or scutellum partially obscure ferruginous; tergites 2-7 red (form syphax *Cresson), or only 2-3 red, and 4-7 black (form* rufizonatus *Cresson); flagellum usually with white annulus, sometimes entirely black; wings but slightly, or not, infuscated; legs fairly long and slender, third sternite with more or less distinct plica; length 10-14 mm.*

Flagellum.—Bristleshaped, long and slender, extremely attenuated toward apex, acutely pointed, ventrally flattened beyond middle, but not widened, usually with 47-48 (rarely 46) segments (in type of *syphax*—a Delaware specimen—53), the first three times as long as wide, about the ninth square, the widest slightly, or not, wider than long. Black, with white annulus on segments 7 or 8, or 9, or 10 to 11 or 12, sometimes entirely black.

Head.—Temple and cheek profiles moderately narrowed, the former with curved, the latter with nearly straight outline; malar space almost as long as the width of base of mandible. Black; often clypeus obscure ferruginous, rarely frontal orbits of the same color.

Thorax.—Mesoscutum slightly convex, fairly finely and moderately densely punctured, somewhat shiny; scutellum distinctly raised above postscutellum, dorsally slightly convex and gradually sloping to the latter; area superomedia about as long as wide, sometimes a little longer than wide, or somewhat wider than long. Black; scutellum often dark ferruginous.

Legs.—Fairly long and slender. Uniformly black; tibiae III at base and the anterior tarsi often brownish; apex of femora I and the tibiae I interiorly ivory.

Abdomen.—Median field of postpetiolus densely striate; gastrocoeli on the average rather shallow, their outline close to quadrangular; thyridia sometimes fairly distinct; second and third tergites moderately densely and moderately strongly punctured; third sternite usually with distinct plica. In majority of specimens tergites 2-7, sometimes also postpetiolus, red; in the form *rufizonatus* only tergites 2 and 3 red, the first segment and the apical four black.

Male

The reasons which have caused me to associate, tentatively, *electus* Cresson male, as described below, with *syphax* Cresson female have been discussed in the preamble. I would like to add here that there is one thing which makes the association somewhat doubtful: *syphax* ♀ has a very slender flagellum with extremely elongate basal segments, while *electus* ♂ has comparatively shorter basal flagellar segments than most of the other species. But this may well be a special feature of sexual dimorphism in the genus.

Black, with a very rich, but variable, white pattern on thorax (often including propodeum) and on legs, usually including all coxae, tibiae and tarsi; coxae III often predominantly white; tergites 2-3 or 4, or entire abdomen (except first segment) often orange; often abdomen uniformly black; length 12-15 mm.

Flagellum.—With 43-47 segments and with very short, oval tyloides on segments 5-18 or 19, the longest reaching bases but not apices of segments; segments

[2a]Meanwhile by field observations additional evidence has been found supporting the assumption that *electus* is correctly associated as male with *syphax* female.

comparatively very short: seen from the side which bears the row of tyloides the third to fifth approximately square, the following becoming gradually increasingly wider than long, first segment a little more elongate than in *ultus*. Black, scape ventrally white.

Head.—Black; face and clypeus white; often a more or less indistinct, longitudinal black line on the upper part of facial median field, or also narrow blackish sutures surrounding the median field.

Thorax.—Mesoscutum convex, moderately densely punctured, shiny; scutellum fairly strongly convex, gradually slanting toward the postscutellum; area superomedia usually square, sometimes slightly wider than long. Black; the following are white: collare, pronotal ridge, subalarum, tegulae, scutellum, postscutellum and usually some markings on the propodeum, as on the apex of the area superomedia and on apices of areae dentiparae, sometimes the entire area superomedia, sometimes a small mark on apex of pronotal base, or a small mark on prosternum.

Legs.—Slender, femora III more slender than in *ultus*. Black; the following are white: all coxae partially, often predominantly, or even almost entirely, usually more restricted marks on trochanters, interior side of femora I or I and II, tibiae I and II usually except an infuscated, longitudinal stripe on apical part of ventral side, tibiae III except the broadly black apex and usually also except the narrowly black base (rarely tibiae III predominantly black with reduced white, median pattern), tarsi I and II entirely, often tarsi III partially or predominantly.

Abdomen.—Gastrocoeli small and rather shallow; sculpture of tergites 2-4 very dense, opaque. Either uniformly black or partially orange; in the latter case the orange color may occupy the second and third tergites only, or tergites 2-4, sometimes the entire abdomen except the first segment.

14. *Ctenichneumon ruidosensis* (Cockerell)

Ichneumon ruidosensis Cockerell, 1898, Am. Mag. Nat. Hist., (7) 2:456, ♂.

Types

Holotype.— ♂, New Mexico, Ruidoso, 6800 feet. U.S.N.M.

Distribution

New Mexico.

Preamble

Similar to *semicaeruleus* (Cresson) but distinctly differing by considerably more narrowed cheek profile. This male could perhaps be associated with *punctiscuta*, new species, but, with regard to the lack of material and of any kind of confirming evidence, such an association represents no more than a mere guess, and so I do not feel ready to announce it, even tentatively.

Male

(Type specimen.)

Bright metallic blue including abdomen; scutellum predominantly and other parts white; tibiae III black, not white marked; length about 13 mm.

Flagellum.—With tyloides on segments 5-18.

Head.—Cheek profile strongly narrowed. Blue; clypeus and face laterally white.

Thorax.—Scutellum strongly raised above postscutellum, dorsally fairly flat, apically slanting in a steeply rounded slope; area superomedia strongly trans-

verse, about three times as wide as long. Blue; the following are white: pronotal ridge predominantly, subalarum, tegulae and scutellum except narrow base and apex.

Legs.—Black; the following are white: anterior side of femora I, femora II apically on anterior side, tibiae and tarsi I and II dorsally.

Abdomen.—Third sternite with plica. Uniformly metallic blue.

21. Genus *Exephanes* Wesmael

Exephanes Wesmael, 1844, Acad. Sci. Bruxelles Nouv. Mém., 18:13, 17.

Type.—*Ichneumon hilaris* Gravenhorst. Designated by Ashmead, 1890. *Octatomus* Tischbein, 1881, Stettin. Ent. Ztg., 42:186.

Type.—(*Octatomus tricolor* Tischbein) = *Exephanes femoralis* Brischke. Monobasic.

Females of this genus are particularly characterized by the structure of the abdominal apex which is more or less distinctly laterally compressed and surpassed by the projecting ovipositor which has unusually wide sheaths (Figs. 11, 12). The last sternite is large and prolonged as in the amblypygous genera, but the compressed seventh tergite and the often visible eighth show also a tendency for more or less considerable prolongation, in some species (as in the type-species) surpassing the hypopygium considerably and thus forming ventrally a slit uncovered by the latter. By this reason the genus as a whole can not actually be called "amblypygous"; some species are clearly amblypygous, others scarcely semiamblypygous, depending on whether the process of the prolongation of the apical segments favored the hypopygium or the last tergites more. Males are not so well characterized as females and are rather similar to *Ichneumon* Linnaeus and even more so to *Ectopimorpha* Viereck. They can be distinguished from *Ichneumon* by the small or subobsolete gastrocoeli without distinct thyridia; there is almost no generic distinction between *Exephanes* and *Ectopimorpha* males, except that in the former the hypopygium is on the average somewhat longer and often medially a little produced.

Flagellum.—Of females always bristleshaped, slender, considerably attenuated toward apex and not widened beyond middle; of males with a row of 7-14 bacilliform or longish-oval tyloides beginning not before the fifth segment.

Head.—With more or less considerably narrowed temple and cheek profiles; malar space of females usually longer than width of base of mandible; mandibles normal, fairly slender, the upper tooth somewhat larger than the lower.

Thorax.—Mesoscutum slightly convex in females, considerably more so in males; notauli obsolete; scutellum slightly raised above postscutellum in females, considerably more in males; carination of propodeum usually complete, including costulae, the latter sometimes subobsolete; area superomedia hexagonal, approaching the outline of that in the *Melanichneumon* group, receiving the costulae at or beyond the middle, and often slightly narrowed from costulae toward base, the latter touching the basal transverse furrow of the propodeum which replaces the area basalis (Fig. 32).

Legs.—Fairly slender to moderately stout; coxae III of females never with scopa.

Abdomen.—From rather slender as in the type-species to fairly stout, laterally slightly compressed toward apex in females with the ovipositor distinctly projecting; sheaths of ovipositor wider than usual; eighth tergite of females usually visible; in females, seventh tergite and hypopygium both prolonged in a manner

which alternates somewhat among the species, sometimes the hypopygium covering almost the entire length of ventral slit, sometimes the seventh tergite distinctly surpassing the hypopygium and forming a distinct ventral slit; hypopygium of males slightly prolongated and apico-medially rounded; gastrocoeli small and shallow, in American species almost subobsolete, thyridia obsolete; median field of postpetiolus in all European species distinctly longitudinally striate, in American species weakly or indistinctly striate or almost smooth. Abdomen of males slender, approximately parallel-sided.

Color.—In all six known European species, thorax black with white scutellum, abdomen tricolored: red, apically black with white anal marks; in American species the black color is largely replaced by ferruginous and the white anal marks tend to disappear. Only the eastern populations of *terminalis* (Provancher) agree with the European species in having apex of abdomen black with a white anal mark.

Biology.—Exephanes species are parasites of Noctuides with cryptophagous, grass-boring larval stages, in Europe of *Nonagria, Tapinostola, Leucania, Hydroecia* and *Mina.* The hosts of American species are unknown. Females of all species hibernate as adults. I found the American *terminalis* frequently hibernating in rotten stumps or logs, once 50 specimens gregariously in the same stump.

Distribution.—Temperate Zones of the New and Old Worlds.

Key to the Species of *Exephanes* Wesmael of America North of Mexico

Females

1. Basic color of tergites 4-6 or at least 5 and 6 black. (Puncturation of second tergite very fine, of third extremely fine.) 2
   Basic color of tergites 2-7 ferruginous. (Puncturation of second and third tergites somewhat more distinct.) 3
2. Seventh tergite with white, apical mark; femora III predominantly or entirely black. (Length 9-12 mm.) ..... 1 a. *terminalis terminalis* (Provancher)
   Seventh tergite without white, apical mark; femora III ferruginous with black apex. (Length 9-10 mm.) ..... 1 b. *terminalis immaculatus,* new subspecies
3. Area superomedia long, nearly parallel-sided, confluent with area basalis; malar space almost twice as long as width of base of mandible; flagellum with 42-44 segments; femora III more slender than in the alternative species; tergites 2-4 or to 5 with narrow, blackish, apical bands; length 10-12 mm. ..... 2. *subfulvus* (Cresson)
   Area superomedia hexagonal, not confluent with area basalis, narrowed from costulae toward base and often wider than long; malar space about 1.5 times as long as width of base of mandible; flagellum with 36-38 segments; femora III stouter than in alternative species; only tergites 2 and 3 with narrow, blackish, apical bands; the first segment partially or entirely black; length 9-10 mm. .... 3. *californicus,* new species

Males

1. Tergites 4-7 and femora III black; tergites 2 and 3 very finely punctured and finely alutaceous between punctures, nearly opaque; length 9-12 mm. ..... 1. *terminalis* (Provancher)
   Basic color of tergites 4-7 ferruginous; tergites 2 and 3 distinctly and densely punctured, not alutaceous between punctures and more shiny; length 10-12 mm. ..... 3. *californicus,* new species

Remarks

Male of the third species, *subfulvus,* not known yet. It may be rather similar to *californicus.*

1. *Exephanes terminalis* (Provancher)

Figs. 11, 12, 17, 32

Distribution

Probably transcontinental in Transition and Canadian Zones. So far recorded from Atlantic to Continental Divide in Canadian Zone (by H. Townes, 1951), from Transition Zone of Maine, Ontario and Quebec (C.G.H. and C.N.C.), from Northwest Territories (C.N.C.) and from Colorado (C.H.T.).

Female

Predominantly ferruginous including head and mesoscutum; scutellum yellow or pale ferruginous; tergites 4-7, femora more or less extensively, and usually sterna black; seventh tergite in eastern subspecies with large white anal mark; length 9-11 mm.

Flagellum.—Bristleshaped, moderately long, extremely attenuated, with acute apex, ventrally not distinctly flattened beyond middle and not at all widened, with 35-37 segments, the first more than twice as long as wide, about the ninth square. Ferruginous, including scape; segments 8-12 usually with yellowish annulus, apex infuscated.

Head.—Cheek and temple profiles fairly strongly narrowed, the latter with slightly curved, the former with straight outline; cheeks long, malar space distinctly longer than width of base of mandible. Usually ferruginous except the black ocellar region; often also middle of frons more or less extensively and clypeus partially or entirely, sometimes also temple region of occiput, black.

Thorax.—Mesoscutum slightly convex, fairly finely and sparsely punctured; scutellum somewhat raised above postscutellum, dorsally slightly convex, shiny; carination of propodeum almost complete, costulae present, area superomedia and basalis often confluent, or weakly separated, the former usually slightly narrowed from insertion of costulae toward base as well as toward apex (Fig. 32). Ferruginous; scutellum yellowish or ferruginous like the rest; in the eastern subspecies the following are black: prosternum, prepectus, mesosternum extensively or entirely, propodeal and scutellar sutures.

Legs.—Moderately slender. Ferruginous; the following are black: apex of tibiae III broadly, femora III partially or entirely, usually femora II partially or predominantly, rarely femora I dorsally in part, sometimes coxae I and II basally or more extensively, often trochanters III, more rarely all trochanters partially; sometimes tibiae III medially yellowish.

Abdomen.—Median field of postpetiolus laterally not sharply and clearly bordered, almost smooth, often with very fine, rather indistinct longitudinal striation; gastrocoeli subobsolete, indicated by a very small and shallow impression (Fig. 17); second tergite very finely and sparsely, the third extremely finely and sparsely, punctured, almost smooth. Basic color of tergites 1-3 ferruginous; 4-7 black; seventh tergite in the eastern subspecies usually with large, white dorsal mark, which sometimes may be more or less reduced or exceptionally obsolete; sixth tergite, too, sometimes with restricted white anal band; often third tergite narrowly black at apex, rarely infuscated at the base also; rarely second tergite too with black apical border.

Male

Thorax black, scutellum yellow; abdomen black, tergites 2-4 yellow with a slight orange tint, especially on the second tergite; second tergite with a conspicuous, more or less extensive black apical band or patch, the third usually with

narrowly black apical margin, the fourth often with black basal and apical bands; all trochanters and coxae I and II predominantly yellow; apex of tibiae III and the femora III black; length 9-12 mm.

Flagellum.—With narrow, bacilliform tyloides on segments 7 or 8 to 16 or 17, the longest on segments 10-14, almost reaching from bases to apices of segments. Pale ferruginous (orange) at least ventrally, usually also dorsally; apex and dorsal side sometimes infuscated; scape ventrally yellow.

Head.—Temple profile narrowed with slightly curved outline; malar space a little more than half as long as the width of base of mandible. Black; the following are white: mandibles except teeth, face, clypeus and frontal orbits narrowly.

Thorax.—Mesoscutum distinctly convex, longer than wide, shiny, sparsely and fairly finely punctured; notauli obsolete or slightly indicated at base; scutellum convex, distinctly raised above postscutellum; carination of propodeum complete; area superomedia hexagonal, with costulae inserted behind middle, narrowed from costulae toward base, often indistinctly separated from area basalis. Black; the following are white: scutellum, often collare, usually apex of pronotal ridge, subalarum; tegulae white or ferruginous.

Legs.—All trochanters and trochantelli, coxae I and II predominantly or entirely and coxae III ventrally toward apex white; the following are black: basic color of coxae III, sometimes coxae I and II narrowly at base, apex of tibiae III, femora III, often femora I and II dorsally more or less extensively; the rest yellowish.

Abdomen.—Median field of postpetiolus shiny, nearly smooth, with very fine, usually indistinct, longitudinal striation; gastrocoeli subobsolete, narrow thyridia visible; tergites sparsely and finely punctured, finely alutaceous between punctures; hypopygium slightly angularly projecting. Black, basic color of tergites 2-4 yellowish, often with slight orange tint, especially on second tergite, the latter with conspicuous black apical band or patch (sometimes occupying the greatest part of the surface); usually apical margin of third tergite narrowly black; fourth tergite often with black basal and black apical band as well.

Table IV

Chromatic variability of 50 femlaes of *Exephanes terminalis* (Prov.) found gregariously hibernating in one stump near Poltimore, Province of Quebec.

33	*Head* almost entirely ferruginous except the black ocellar region
17	Also middle of frons and occipital region more or less extensively black
13	Clypeus more or less infuscated
50	*Thorax* ferruginous, mesosternum and prosternum entirely or partially black
28	Scutellum yellow or yellowish
22	Scutellum ferruginous like the mesoscutum
48	*Abdomen* with tergites 1-3 ferruginous, 4-7 of black basic color
2	tergites 1-4 ferruginous
26	third tergite with narrow, black apical band
6	second tergite with narrow, black apical border
6	third tergite basally somewhat infuscated
47	tergite seven with large, white anal mark
2	also the sixth tergite with narrow, white apical line
13	white mark on seventh tergite strongly reduced
50	*Legs* ferruginous, femora III predominantly or entirely, femora II partially, black
48	tibiae III ferruginous, apically black
2	tibiae III ferruginous, medially yellowish, apically black

1 a. *Exephanes terminalis terminalis* (Provancher)

Phygadeuon terminalis Provancher, 1874, Nat. Canad., 6:284, ♀.
Ichneumon caudatus Provancher, 1875, Nat. Canad., 7:24, 82, ♀.
Ichneumon pomilus Provancher, 1877, Nat. Canad., 9:9, ♂.
Phygadeuon geddessii Provancher, 1886, Addit. Corr. Faune Ent. Canada Hym., p. 54, ♀.
Amblyteles cookii Ashmead, 1890, U.S. Nat. Mus. Proc., 12:392, ♀.
Exephanes terminalis Heinrich, 1959, Canad. Entom., 91:806, ♀ ♂.

Types

Holotypes.–Phygadeuon terminalis Provancher, ♀, Quebec. Provincial Museum, Quebec. *Ichneumon caudatus* Provancher, ♀, Quebec. Provincial Museum, Quebec. *Ichneumon pomilus* Provancher, ♂, Quebec. Provincial Museum, Quebec. *Phygadeuon geddessii* Provancher, ♀, Ontario (Toronto). Provincial Museum, Quebec. *Amblyteles cookii* Ashmead, ♀, Michigan (Lansing). U.S.N.M.

Distribution

According to H. Townes 1951: "Atlantic to Continental Divide in Canadian Zone". Rather common in the Transition Zone of Quebec and Ontario, and in Maine. Found in stands of tall grass in clearings in woodland, frequently in stands of the grass *Calamagrostis canadensis* (Nutt.); sometimes hibernates gregariously in stumps.

Female

The seventh tergite in majority of specimens with large, sometimes with reduced, white anal mark; femora III predominantly or entirely black; length 9-12 mm.

Male

See description of the conspecies.

16. *Exephanes terminalis immaculatus*, new subspecies

Types

Holotype.– ♀, Colorado, Steamboat Springs, 6.VIII.1948, H., M., G., D. and J. Townes. C.H.T.

Allotype.– ♂, Colorado, Steamboat Springs, 6.VIII.1948, H., M., G., D. and J. Townes. C.H.T.

*Paratype.–*1 ♀, Colorado, Estes Park, 14.VIII.1948, H., M., G., D. and J. Townes. C.H.T.

Distribution

Colorado (types); one specimen from Northwest Territories, Fort Smith, (C.N.C.), may belong here.

Female

Differs from *terminalis terminalis* by the lack or the obsolescence of the white anal mark on the seventh tergite and the reduction of black color of femora III to their apex; perhaps on the average somewhat smaller; length 9-10 mm.

Male

Agrees with *terminalis terminalis;* in the single known specimen the vertical orbits are pale orange.

2. *Exephanes subfulvus* (Cresson)

Ichneumon subfulvus Cresson, 1865, Ent. Soc. Phila. Proc., 4:258, ♀.

Types

Holotype.—♀, Colorado. A.N.S.

Paratype.—1 ♀, Colorado. A.N.S.

Distribution

According to H. Townes 1951: "Colorado, Alberta". New records: Saskatchewan (C.H.T.); probably Quebec (C.G.H.).

Preamble

The species is distinguished by the extremely slender flagellum with more than 40 segments which are all longer than wide, by the slender femora III, the long malar space and the almost uniformly ferruginous color.

Female

Ferruginous; tergites 2-4 or 5 with narrow, blackish, apical margins; apex of tibiae III and sometimes of femora III infuscated; flagellum (type) with 44 segments; length 10-12 mm.

Flagellum.—Bristleshaped, slender and fairly long, extremely attenuated and acutely pointed at apex, not at all widened beyond middle, with 42 (specimen from Quebec) to 44 (type specimen) segments, the first segment more than 3 times as long as wide, all segments longer than wide. Ferruginous, without annulus.

Head.—Temple profile and cheek profile considerably narrowed with almost straight outlines; malar space very long, almost twice as long as width of base of mandible. Ferruginous.

Thorax.—Mesoscutum distinctly, but not densely, punctured; area superomedia long, almost parallel-sided, smooth, not clearly separated from area basalis; costulae subobsolete in type. Ferruginous.

Legs.—Slender; femora III relatively longer and more slender than in *terminalis* (Provancher) and in *californicus*, new species. Ferruginous; apex of tibiae III and sometimes also of femora III infuscated.

Abdomen.—Median field of postpetiolus ill-defined, almost smooth; gastrocoeli subobsolete, indicated only by a small, smooth triangle; second tergite moderately finely and sparsely, the third more finely and sparsely, both, however, more distinctly, punctured than in *terminalis*. Ferruginous; tergites 2-4 or 5 with blackish, narrow, apical bands.

Remarks

One female collected hibernating under moss covering a rotten stump in a cedar swamp in Quebec shows the main characters of this species, but is comparatively large (12 mm. long), and has a yellow scutellum, only tergites 2 and 3 apically black banded and the femora III apically broadly black. It may represent a new eastern subspecies.

3. *Exephanes californicus*, new species

Types

Holotype.—♀, California, Hallelujah Junction, 27.VI.1949, A. S. Deal. C.H.T.

Allotype.—♂, California, Hallelujah Junction, 27.VI.1949, R. C. Bechtel. C.H.T.

Paratypes.—4 ♀♀, 3 ♂♂, California; 1 ♀, Utah; 2 ♂♂, Colorado; 1 ♂, Arizona. C.H.T.

Distribution

California, Colorado, Arizona (C.H.T.).

Preamble

Females are chromatically and in flagellar proportions extremely similar to *E. subfulvus* (Cresson), but differ by somewhat stouter femora III, somewhat shorter malar space and flagellum and by only the second and third tergites being apically blackish banded.

Female

Ferruginous; tergites 2 and 3 with narrow, blackish, apical margin; apex of tibiae III slightly infuscated; flagellum with 36-38 segments; length 9-10 mm.

Flagellum.—Bristleshaped, slender, extremely attenuated and acutely pointed at apex, not at all widened beyond middle, with 36-38 segments, the first segment fully three times as long as wide, all segments longer than wide. Ferruginous, somewhat infuscated toward apex, without annulus.

Head.—Temple profile and cheek profile considerably narrowed with almost straight outlines; malar space somewhat shorter than in *subfulvus*, about 1.5 times as long as width of base of mandible. Ferruginous.

Thorax.—Mesoscutum distinctly, but not densely punctured, area superomedia hexagonal, about as long as wide, or slightly wider than long, not confluent with area basalis, narrowed from costulae toward base; costulae distinct. Ferruginous; base and apex of prosternum, base of prepectus, mesosulcus, apical margin of mesopleura, propodeal and scutellar sutures black.

Legs.—Moderately slender; femora III somewhat stouter than in *subfulvus*. Ferruginous, apex of tibiae III slightly infuscated.

Abdomen.—Median field of postpetiolus not clearly but somewhat better defined than in *subfulvus*, shiny, with very fine, longitudinal striation, or almost smooth; gastrocoeli subobsolete, indicated by a very small and shallow impression; second tergite moderately finely and sparsely, the third more finely and sparsely, punctured. Ferruginous; second and third tergites with narrow, blackish apical band; often petiolus ventrally black.

Male

Thorax black, scutellum yellow; abdomen ferruginous, tergites 2 and 3 sometimes basally pale yellow tinted; tergite 1 partially, the second and third, sometimes also the fourth and fifth at apices narrowly black; legs ferruginous, all trochanters and the coxae I and II yellow; apex of tibiae III and usually apex of femora III dorsally black; length 10-12 mm.

Flagellum.—With 37-40 segments and with bacilliform tyloides on segments 7 to 15 or 16. Dorsally black, ventrally pale ferruginous; scape ventrally yellow.

Head.—Temple profile narrowed with almost straight outline; malar space about half as long as width of base of mandible. Black; the following are yellow: mandibles, clypeus, face, cheeks, frontal and vertical orbits broadly, sometimes rest of hind orbits narrowly.

Thorax.—Mesoscutum distinctly convex, shiny, sparsely and fairly finely punctured; notauli slightly indicated at base; scutellum convex, distinctly raised above postscutellum; carination of propodeum complete, with distinct costulae; area superomedia hexagonal, with costulae inserted behind middle, narrowed from

costulae toward base, usually somewhat wider than long. Black; the following are yellow: collare, apex of pronotal ridge (rarely pronotal ridge predominantly), subalarum, tegulae, scutellum; in specimens from California, sometimes irregular, dark ferruginous marks on propleura in front of subalarum, on mesopleura and on metapleura; rarely mesoscutum with ferruginous, longitudinal stripes between median and lateral lobes.

Legs.—Predominantly yellow; coxae III black, except sometimes a yellow mark apically on ventral side, or a ferruginous dorsal mark; femora III ferruginous, usually dorsally at apex blackish; tibiae III yellow with black apex, turning ferruginous toward the latter; femora I and II slightly ferruginous tinted.

Abdomen.—Median field of postpetiolus shiny, nearly smooth or finely, longitudinally striate; gastrocoeli subobsolete, a narrow thyridial impression visible; tergites more densely punctured than in *terminalis* (Provancher), but not alutaceous between punctures and therefore more shiny. Ferruginous; tergites 2 and 3 basally sometimes pale yellow tinted; the following are black: petiolus ventrally and dorsally in basal part, postpetiolus apically, sometimes entire first segment except sides; narrow, apical bands on second and third, sometimes also on fourth, exceptionally on fifth segment.

22. Genus *Ectopimorpha* Viereck

Figs. 2, 5, 8

Ectopimorpha Viereck, 1912, U.S.N. Mus. Proc., 43:589.

Type-species.—(*Amblyteles anceps* Cresson) = *Ischnus wilsoni* Cresson. Orig. design.

Related to *Limerodops* Heinrich and *Exephanes* Wesmael. Females are well distinguished by the peculiar shape of their abdomen, which is elongate, narrow and gradually compressed toward apex, the latter being amblypygous (Figs. 2, 5); the sheaths of ovipositor projecting somewhat; another generic character is presented by the gastrocoeli, which are subobsolete as in *Exephanes terminalis* (Provancher), only more so (Fig. 8). In the type-species of the genus the puncturation of anterior tergites is almost obsolete, their sculpture being smooth and shiny. The latter character, however, is not present in all species being brought together at present in this genus. Males of the type-species of the genus have a yellow banded abdomen and thus resemble males of the *laetus* group of the genus *Ichneumon* Linnaeus. They are recognizable by the almost smooth and shiny sculpture of postpetiolus and anterior tergites, the subobsolete gastrocoeli and the peculiar areolation of the propodeum. These are, at the same time, the only characters available till now for the distinction of the genus in the male sex.

Flagellum.—Of females slender, bristleshaped, considerably attenuated at apex, moderately long; of males with a moderately short row of narrow, elongate tyloides.

Head.—Of females with scarcely (type), or moderately, narrowed, rounded temple profile; cheek profile more or less distinctly narrowed; mandibles fairly short, with relatively short, normal teeth.

Thorax.—Mesoscutum but slightly convex, or almost flat; scutellum distinctly raised above postscutellum, dorsally a little convex; carination of propodeum almost complete, the costulae present, the carina separating area superomedia and basalis often partially obsolete; area superomedia with costulae beyond middle, usually slightly narrowed toward scutellum from insertion of costulae (in the type-species smooth in contrast to adjacent areae).

Legs.—Moderately slender; coxae III never with scopa.

Abdomen.—Elongate, narrow, in females distinctly tapering toward apex and at the same time gradually more and more compressed, strongly amblypygous, ovipositor nevertheless somewhat elongate and projecting (Figs. 2, 5); petiolus gradually widening into postpetiolus, the latter in type-species of the genus without clearly defined median field, shiny and almost smooth, in other species with longitudinally striate median field; gastrocoeli subobsolete, indicated by a very small and superficial impression.

Color.—Basic color of all known species ferruginous with restricted black pattern; sexual dimorphism in the type-species considerable and following the rule of the *laetus* group of *Ichneumon*, the males having a yellow banded abdomen; in other species sexual dimorphism moderate.

Biology.—The host of only one species, *luperinae* Cushman, is known, which seems to be monophagous on the stem boring Hadenine, *Luperina stipata* Morr. According to Decker (Iowa State Coll. Journ. Sci. 1935, 9:571) the parasites emerged between the middle of July and the middle of August from the pupae of the host, the caterpillars of which had been collected 7-10 days before pupating and some even two weeks earlier. This means that *Ectopimorpha luperinae* attacks the larvae of its host as do *Limerodops*, *Pseudamblyteles* Ashmead and other amblypygous genera. The period of emergence seems to indicate that females hibernate. I suppose that this applies to all species of the genus, but so far, no hibernating data have been recorded.

Distribution.—Nearctic.

Remarks

The genus seems to be divided into two natural groups of species: the *wilsoni* group with polished anterior tergites and, seen in profile, less truncate seventh tergite, and the *luperinae* group with alutaceous, opaque or subopaque anterior tergites, and, seen in profile, more truncate seventh tergite. In the former group the apex of female abdomen is light, and femora and flagellum are stouter; in the latter the apex of female abdomen is black, and femora and flagellum are more elongate and slender.

Key to the Species of *Ectopimorpha* Cushman of America North of Mexico

Females

1. Second tergite polished and shiny, without basic alutaceous sculpture. 2
   Second tergite opaque or subopaque, finely alutaceous. 5
2. Temple profile with strongly curved, bulging outline; abdomen from the second tergite distinctly, from the fourth sharply, laterally compressed, as in the European genus *Limerodes* Wesmael; length 10 mm. Abdomen uniformly ferruginous; flagellum without annulus.) ..... 4. *limerodops*, new species
   Temple profile with but slightly curved, not at all bulging outline; sometimes second tergite slightly, the following tergites more distinctly, but never sharply, laterally compressed; length 12-13 mm. (Either abdomen black banded or flagellum with annulus.) 3
3. Flagellum with distinct white annulus, tergites 1-5 ferruginous, without black bands or margins. (Seventh tergite usually with yellow mark; length 13 mm.) ..... 1. *wilsoni* (Cresson)
   Flagellum without annulus; several of the five anterior tergites black banded or black margined. 4

4. Femora III ferruginous; second tergite without black band. (Bases of third and fourth tergites narrowly and the base of the fifth more broadly black; length 12 mm.) ..... 2. *biulca* (Cresson)

Apical half or whole length of femora III black; second tergite with fairly broad, black, apical band. (Bases of third and fourth tergites narrowly and the base of the fifth more broadly black; length 11-12 mm.) ..... 3. *biulcops*, new species

5. Tergites 2-4, femora III and tibiae III uniformly dark ferruginous. (Length 14 mm.) ..... 6. *californica*, new species

Tergites 2-4 or to 5 with black apical bands; femora III and tibiae III apically black. 6

6. Tergites 2-4 with narrow, the fifth tergite with broader black apical band, sixth and seventh tergite entirely black; petiolus gradually widening into postpetiolus. (Length 11-12 mm.) ..... 5. *luperinae* Cushman

Tergites 2-4 with fairly broad, black apical bands, fifth to seventh tergite entirely black; petiolus more abruptly widening into postpetiolus. (Length 11-12 mm.) ..... 7. *indemnis* (Cresson)

Males[3]

1. Tergites 2 and 3 predominantly lemon-yellow, the following tergites black; flagellum usually with a more or less distinct, narrow white annulus. (Thorax and head black with yellow patterns; length 12-13 mm.) ..... 1. *wilsoni* (Cresson)

Basic color of abdomen ferruginous; flagellum never with an annulus. 2

2. Abdomen and legs uniformly dark ferruginous. (Length 13 mm.) ..... 6. *californica*, new species

Abdomen black banded, legs III partially black. 3

3. Tergites 6 and 7 black. (Tergites 2-4 with narrow, the fifth with broader, black apical bands; length 14 mm.) ..... 5. *luperinae* Cushman

Tergite 6 or at least the seventh tergite not black. 4

4. Apical margins of tergites 2-4 blackish; mesoscutum, pleura and propodeum predominantly ferruginous; apex of femora III black. (Length 11 mm.) ..... 8. *scibilis* (Cresson)

Basal margin of tergite 4, or 3 and 4, and broad, basal band on tergites 5 and 6, black; basic color of entire thorax black; femora III almost entirely black. (Length 11-12 mm.) 5

5. Temple profile widened, with bulging outline; cheeks inflated, in vertical (direct) front view outline of both cheeks simultaneously visible behind middle of eye. ..... 10. *boops*, new species

Temple profile not widened, although not narrowed either, with strongly curved but not bulging outline; outlines of both cheeks in vertical front view hidden by eyes. ..... 9. *utahensis*, new species

1. *Ectopimorpha wilsoni* (Cresson)

Figs. 2, 5, 8, 50

Ischnus wilsoni Cresson, 1864, Ent. Soc. Phila. Proc., 3:188, ♂.
Ichneumon anceps Cresson, 1867, Amer. Ent. Soc. Trans., 1:309, ♀.

Types

Holotypes.–Ischnus wilsoni Cresson, ♂, Virginia. A.N.S.; *Ichneumon anceps* Cresson, ♀, Delaware. A.N.S.

Distribution

According to H. Townes 1951: "Atlantic to 100° West in Transition Zone".

Preamble

The species differs from the others of the genus by the shiny, almost smooth sculpture of postpetiolus and entire surface of second tergite. The male resembles chromatically an *Ichneumon* Linnaeus but is distinguished by the mentioned sculpture of anterior tergites and by the obsolete gastrocoeli.

[3]As at present only 3 out of 7 described females are associated with males, the key for the males is very incomplete and therefore of limited value for specific identification.

Male

Black, scutellum and basic color of tergites 2 and 3 yellow; flagellum usually with more or less distinct white annulus; second and third tergites usually with black apical bands; legs yellow, coxae III, femora III and apex of tibiae III black; length 12-13 mm.

Flagellum.—With elongate, bacilliform tyloides on segments 7-17, the longest on segments 9-15 almost reaching from bases to apices of segments. Black, ventrally ferruginous, usually with more or less distinct white annulus; scape ventrally yellow.

Head.—Temple profile slightly narrowed with slightly curved outline; malar space a little shorter than width of base of mandible. Black; the following are yellow: mandibles except teeth, clypeus, face, frontal and vertical orbits broadly up to the edge of occipital declivity, apical part of cheeks and outer orbits up to temple region.

Thorax.—Mesoscutum convex, fairly densely punctured; notauli basally slightly indicated; scutellum considerably raised above postscutellum, convex; area superomedia hexagonal with the costulae beyond middle, narrowed toward base. Black; the following are yellow: collare, pronotal ridge, subalarum, tegulae, scutellum.

Legs.—Moderately slender. Yellow; the following are black: coxae III, femora III, apex of tibiae III broadly.

Abdomen.—Median field of postpetiolus fairly clearly defined, shiny, nearly smooth, with faint vestiges of longitudinal striae; gastrocoeli indicated by a small and narrow longitudinal impression; second tergite shiny, sparsely and extremely finely punctured. Black; second and third tergites yellow with black, medially usually somewhat widened apical bands, usually between the yellow base and black apex slightly orange tinted.

Female

Ferruginous, scutellum and a mark on seventh tergite usually yellow; apex of femora and of tibiae III black; flagellum black or blackish except first segment and white annulus; postpetiolus and entire surface of second tergite shiny and nearly smooth; length 13 mm.

Flagellum.—Bristleshaped, very slender, moderately long, extremely attenuated toward apex and acutely pointed, ventrally not distinctly flattened beyond middle and not at all widened, with 39-41 segments, the first fully three times as long as wide, about the eighth square. Blackish, with white annulus on segments 8 or 9 to 14 or 15, the scape and the first flagellar segment ferruginous.

Head.—Temple profile not, cheek profile moderately, narrowed, both with slightly curved outlines; malar space somewhat longer than width of base of mandible; mandibles fairly stout with short and strong teeth. Ferruginous.

Thorax.—Mesoscutum slightly convex, fairly densely punctured; notauli obsolete; scutellum distinctly raised above postscutellum, dorsally slightly convex; carination of propodeum complete, costulae beyond middle of area superomedia, the latter hexagonal, a little narrowed from costulae toward area basalis, fairly large (Fig. 50). Ferruginous; scutellum, subalarum and collare usually yellow; propodeal and scutellar sutures, base of prosternum and of prepectus black.

Legs.—Moderately slender. Ferruginous; apex of femora III and of tibiae III black; anterior coxae and trochanters sometimes yellowish.

Abdomen.—Elongate, narrow, tapering and compressed toward apex, strongly amblypygous (Figs. 2, 5); ovipositor projecting a little; petiolus gradually widen-

ing into postpetiolus, the latter shiny and almost smooth with a fairly ill-defined median field (Fig. 8); second tergite with very fine and very sparsely set punctures, shiny and nearly smooth; gastrocoeli almost obsolete, indicated only by a small, shallow impression. Ferruginous; rarely last tergites irregularly infuscated; usually seventh tergite with yellow anal mark.

2. *Ectopimorpha hiulca* (Cresson)

Amblyteles hiulcus Cresson, 1877, Amer. Ent. Soc. Trans., 6:194, ♀.

Types

Holotype.—♀, British Columbia, Lake Lahache. A.N.S.

Distribution

British Columbia.

Preamble

This species is more closely related to the type-species, *wilsoni* (Cresson), than to *luperinae* Cushman and *indemnis* (Cresson), differing from the latter two species by its smooth and shiny sculpture of abdomen, including anterior tergites, and chromatically by the not-infuscated apical tergites. I have seen no other specimens but the type from which the following description is derived.

Female

Pale ferruginous, scutellum yellowish; base narrowly of third and fourth tergites and the base of the fifth more broadly, black; legs ferruginous except black apex of tibiae III; flagellum ferruginous, without annulus; length 12 mm.

Flagellum.—Bristleshaped, slender, considerably attenuated and acutely pointed at apex, not widened beyond middle. Ferruginous, apically infuscated.

Head.—Cheek profile distinctly narrowed with almost straight outline; malar space about 1.5 times as long as width of base of mandible. Ferruginous.

Thorax.—Area superomedia longer than wide, nearly parallel-sided, not clearly separated from area basalis; costulae obsolete. Ferruginous; the following are black: prosternum, middle of propleura, prepectus predominantly, propodeal and scutellar sutures broadly.

Legs.—Uniformly ferruginous including coxae and trochanters, except black apex of tibiae III.

Abdomen.—Petiolus gradually widening into postpetiolus; median field of the latter not clearly defined, shiny, with vestiges of fine, longitudinal striae; second tergite basally with some very fine punctures, becoming increasingly shiny and polished toward apex, as are the following tergites. Ferruginous; very narrow, basal bands on third and fourth tergites and a somewhat broader basal band on the fifth, black.

3. *Ectopimorpha hiulcops*, new species

Types

Holotype.—♀, British Columbia, Fort Nelson, 15.VII.1948, W. R. Mason. C.N.C. No. 7258.

Paratypes.—2 ♀♀, Saskatchewan, Weyburn, 10.VII.1945, J. S. Rempel. C.H.T.

Distribution

British Columbia, Saskatchewan.

I am not sure whether this is a distinct species or a mere mutant of *hiulca* (Cresson). Type and paratypes are almost congruent in color and differ from *hiulca* by the second tergite, which bears a fairly broad, black apical band, and by the half-, or predominantly, black femora III. On the other hand the black basal bands on tergites 3-5 and the black patterns of the thorax are identical with those of *hiulca;* so is the sculpture of abdomen.

Female

Pale ferruginous, scutellum yellowish; second tergite with fairly broad, black apical band; base narrowly of third and fourth and the base of the fifth tergites more broadly black; legs ferruginous, apical half, or almost entire length, of femora III and the apex of tibiae III black; flagellum ferruginous, without annulus, apically infuscated; length 11-12 mm.

Flagellum.—Bristleshaped, considerably attenuated and acutely pointed at apex, not at all widened beyond middle, with 40 segments, the first approximately 3 times as long as wide, about fourteenth approximately square. Ferruginous, without annulus, infuscated toward apex; scape ferruginous.

Head.—Temple profile slightly narrowed, with curved outline; cheek profile distinctly narrowed, with almost straight outline; malar space about 1.5 times as long as width of base of mandible. Ferruginous; supraantennal cavities and ocellar region black.

Thorax.—Mesoscutum slightly convex, fairly densely punctured; notauli basally indicated; scutellum somewhat raised above postscutellum, dorsally scarcely convex; area superomedia somewhat longer than wide, receiving the costulae beyond middle, a little narrowed toward base, not distinctly separated from area basalis. Ferruginous, scutellum yellowish; the following are black: prosternum, prepectus, propleura predominantly, middle of mesosternum, or mesosternum predominantly, band on mesopleura below subalarum, propodeal and scutellar sutures, in type specimen also anterior part of median lobe of mesoscutum.

Legs.—Moderately slender. Ferruginous; apex of tibiae III and apical half of femora III, in type specimen almost entire femora III and the femora II predominantly black.

Abdomen.—Slender, elongate, laterally compressed at apex; median field of postpetiolus not clearly defined, with vestiges of fine longitudinal striae, or polished; second tergite shiny, with very fine, sparse puncturation on basal part; following tergites polished, shiny. Ferruginous; second tergite with fairly broad, black apical band, third and fourth narrowly black at bases, the fifth with broader black basal band; sixth tergite laterally blackish, the seventh with indistinct indication of a yellowish dorsal mark.

4. *Ectopimorpha limerodops*, new species

Types

Holotype.—♀, California, Crane Flat, 25.VII.1948, H., M., G., D. and J. Townes. C.H.T.

Distribution

California.

Preamble

A somewhat aberrant species of the *wilsoni* group, distinguished by the laterally sharply compressed abdomen (as in *Limerodes* Wesmael) of the female

and its wide, strongly curved temple outline. The normal, straight apical border of the clypeus indicates that the species is closer related to *Ectopimorpha* than to *Limerodes*.

The structure of the head matches that of the males of *utahensis*, new species, and *boops*, new species, but the temples are not quite as widened as in the sympatric *boops* and somewhat more widened than in *utahensis*. The mutual relationship of the two species in the male and the correct association of sexes remains to be cleared by further research.

Female

Pale ferruginous; thorax with restricted, head, abdomen and legs without, black pattern; flagellum without annulus, ferruginous, infuscated toward apex; abdomen from the second tergite distinctly, from the fourth sharply, compressed; temple profile with bulging outline; length 11 mm.

Flagellum.—Bristleshaped, slender, considerably attenuated and acutely pointed at apex, ventrally not distinctly flattened beyond middle and not at all widened, with 35 segments, the first fully 2.5 times as long as wide, the twelfth approximately square. Segments 1 to about 12 pale ferruginous, the rest blackish.

Head.—Temple profile slightly widened rather than narrowed, with bulging outline; cheeks inflated, with gradually curved outline; malar space about as long as width of base of mandible; frons convex; mandibles fairly wide and short, the upper tooth scarcely longer than the lower. Uniformly ferruginous.

Thorax.—Mesoscutum slightly convex, finely and fairly punctured, shiny, narrower than the head and longer than wide; notauli basally indicated; scutellum slightly raised above postscutellum; carination of horizontal part of propodeum weak; area superomedia longer than wide, narrowed toward base; costulae, apical carina of area superomedia and carinae dentiparae exteriores obsolete. Ferruginous; the following are black: base and apex of prosternum, prepectus predominantly, mesolcus, a longitudinal band on outer side of mesosternum, propodeal and scutellar sutures.

Legs.—Tarsi elongate; all tarsi considerably longer than their tibiae; claws large. Uniformly ferruginous.

Abdomen.—Postpetiole longer than apically wide, slightly and gradually widened from base to apex, without median field, polished; second and third tergites considerably laterally compressed, dorsally much longer than wide, polished, with scattered, very fine punctures on basal parts; gastrocoeli absent; following tergites strongly compressed, polished. Uniformly ferruginous.

5. *Ectopimorpha luperinae* Cushman

Ectopimorpha luperinae Cushman, 1931, U.S. Nat. Mus. Prov., 79(14): 1, ♀ ♂.

Types

Holotype.—♀, Iowa (Ames), ex *Hadena stipata* (Morr.). U.S.N.M.

Host

Hadena stipata (Morr.).

Distribution

According to H. Townes 1951: "Maine, Massachusetts, Iowa".

Preamble

The female is in appearance and size somewhat similar to *wilsoni* (Cresson), but at once distinguished by the finely alutaceous, scarcely shiny sculpture of

tergites 2 and 3, the absence of a white flagellar annulus, the much more slender femora III, and the color of the sixth and seventh tergites which are black, the latter without anal mark.

Female

Ferruginous, scutellum yellow to ferruginous; narrow, apical bands on tergites 2-4, a broader one on tergite 5, and the entire tergites 6 and 7, black; apices of femora III and of tibiae III black; flagellum without annulus; length 11-13 mm.

Flagellum.—Bristleshaped, long and very slender, extremely attenuated and acutely pointed at apex, ventrally not distinctly flattened and not at all widened beyond middle, with 45-47 segments, the first more than three times as long as wide, the ninth approximately square. Ferruginous, including scape, slightly infuscated toward apex, without annulus.

Head.—Temple profile moderately, cheek profile distinctly narrowed, the former with somewhat curved, the latter with nearly straight outline; malar space distinctly longer than width of base of mandible; mandible fairly stout with short and strong teeth. Ferruginous.

Thorax.—Mesoscutum slightly convex, distinctly and moderately densely punctured; notauli usually basally indicated; scutellum somewhat raised above postscutellum, dorsally flattened; horizontal part of propodeum not much shorter than declivity; carination complete, area superomedia, however, often confluent with area basalis, usually longer than wide, nearly parallel-sided, receiving the costulae about the middle, sometimes nearly square. Ferruginous; sutures and usually base and apex of prosternum black, in one specimen from Maine even mesosternum extensively black.

Legs.—Slender; femora III much more slender than in *wilsoni*. Ferruginous; apex of femora III and of tibiae III black; tarsi III usually somewhat infuscated.

Abdomen.—Elongate, slender, tapering toward apex and apically slightly compressed; ovipositor distinctly projecting; median field of postpetiolus fairly well defined, finely coriaceous or with indication of very fine, longitudinal striation, not shiny; gastrocoeli subobsolete; second and third tergites without distinct punctation, very finely coriaceous, subopaque. Ferruginous; tergites 2-4 with narrow, the fifth with somewhat broader, black apical bands; sixth and seventh tergites entirely black.

Male

Ferruginous, scutellum yellow; head and thorax considerably more extensively variegated with black than in female; tergites 1 or 2 to 4 with black, apical bands, the fifth predominantly, the sixth and seventh entirely black; apices of femora III and of♀ tibiae III black; trochanters and anterior coxae predominantly yellow; flagellum dorsally blackish, ventrally ferruginous; length 14 mm.

Flagellum.—With 45-46 segments and with narrow, bacilliform tyloides on segments 7-16 or 17. Ferruginous, dorsally infuscated or blackish; scape ventrally yellow.

Head.—Temple profile slightly narrowed with curved outline; malar space distinctly shorter than width of base of mandible. Ferruginous; the following are black: supraantennal cavities, middle of frons, ocellar region, temple region extensively and hind part of cheek region; face, clypeus, mandibles and vertical orbits yellow.

Thorax.—Mesoscutum convex, fairly densely punctured; notauli basally indicated; scutellum considerably raised above postscutellum, convex; area superomedia longer than wide, sometimes nearly parallel-sided, and rectangular, sometimes slightly arched anteriorly, with the costulae approximately in the middle. Ferruginous; the following are yellow: collare, subalarum, tegulae, scutellum, apex of pronotal ridge; the following are black: prosternum, mesosternum entirely, propleura and mesopleura more or less extensively (usually predominantly), base of metapleura, scutellar and propodeal sutures, usually lateral lobes of mesoscutum.

Legs.—Slender. Ferruginous; coxae I and II and trochanters I and II yellow; apex of tibiae III and femora III except lateral part black; tarsi III somewhat infuscated.

Abdomen.—Slender; tergites 2-4 longer than wide; median field of postpetiolus fairly well defined, longitudinally striate or finely, irregularly rugose, scarcely shiny; gastrocoeli scarcely impressed, longer than wide, and narrow; second and third tergites sparsely and very finely punctured, finely alutaceous between punctures and subopaque. Ferruginous; tergites 2-4 (sometimes also the postpetiolus) with narrow, the fifth tergite with broader, black apical band; tergites 6 and 7 entirely black.

Remarks

The female of this species is in structure as well as in color surprisingly similar to *Exephanes subfulvus* (Cresson), and can, in spite of its more slender and elongate abdomen, easily be mistaken for it. The safest differential character is presented by the sculpture of the second tergite, which is more distinctly punctured and shiny in the *Exephanes* species, the latter not having the alutaceous under-sculpture between punctures.

6. *Ectopimorpha californica*, new species

Types

Holotype.— ♀, California, Berkeley, 10.III.1934, Bohart. C.H.T.

Allotype.— ♂, California, Alta, 23.VI.1933. C.H.T.

Distribution

California.

Preamble

A species of the *luperinae* group, closely related to *luperinae* Cushman itself, with very finely and sparsely punctured, finely alutaceous and subopaque second tergite, and with distinctly projecting ovipositor; distinguished by its uniformly dark ferruginous (= red-brown) color which includes the entire thorax, abdomen and legs.

Female

Uniformly dark ferruginous, including legs and abdomen; base of prosternum and of prepectus, and some propodeal and scutellar sutures narrowly black; apical tergites of type specimen infuscated (seemingly discolored); flagellum without annulus; length 14 mm.

Flagellum.—Bristleshaped, long and slender, extremely attenuated and acutely pointed at apex, not at all widened beyond middle, with 46 segments, the first more than three times as long as wide, the fourteenth approximately square. Ferruginous, infuscated toward apex.

Head.—Temple profile moderately, cheek profile distinctly narrowed, the former with somewhat curved, the latter with nearly straight outline; malar space distinctly longer than width of base of mandible; mandibles fairly stout with strong and short teeth. Ferruginous.

Thorax.—Mesoscutum slightly convex, distinctly and moderately densely punctured; notauli basally indicated; scutellum somewhat raised above postscutellum, dorsally flat; area superomedia slightly longer than wide, nearly parallel-sided, receiving the costulae about the middle. Ferruginous; base of prosternum and of prepectus, and some propodeal and scutellar sutures inconspicuously black.

Legs.—Slender; femora as slender as in *luperinae*. Uniformly ferruginous.

Abdomen.—As in *luperinae;* median field of postpetiolus very finely, longitudinally striate; second tergite very sparsely and extremely finely punctured, finely alutaceous and subopaque; third tergite basally also very sparsely and extremely finely punctured, gradually becoming polished and shiny toward apex. Uniformly ferruginous; apical three tergites blackish infuscated (this coloration, however, looks irregular and could be caused by discoloration of some kind).

Male

Uniformly ferruginous, including legs and abdomen; flagellum dorsally black, ventrally brown; base of prosternum and of prepectus black as in female; length 13 mm.

Flagellum.—With narrow, bacilliform tyloides on segments 7-15. Dorsally black, ventrally brown; scape ferruginous, lighter ventrally than dorsally, dorsally with infuscated mark.

Head.—Temple profile moderately narrowed with slightly curved outline; malar space about two thirds as long as width of base of mandible. Ferruginous, face and clypeus slightly yellowish tinted.

Thorax.—Mesoscutum and scutellum more convex than in female; otherwise as in female.

Legs.—Uniformly ferruginous; coxae and trochanters I and II lighter than the rest; tarsi III infuscated toward apex.

Abdomen.—Tergites more distinctly and more densely punctured than in female. Uniformly ferruginous.

7. *Ectopimorpha indemnis* (Cresson)

Ichneumon indemnis Cresson, 1877, Amer. Ent. Soc. Trans., 6:172, "♂" = ♀.

Types

Holotype.—♀, British Columbia. A.N.S.

Distribution

British Columbia. New record: Saskatchewan (C.N.C.).

Preamble

Closely related to *luperinae* Cushman by the opaque, finely alutaceous sculpture of second and third tergites and by the black abdominal pattern, the latter, however, more extensive on the apex of abdomen; median part of face and clypeus a little more convex than in *luperinae;* also area superomedia and postpetiolus slightly differently shaped.

Female

Ferruginous; moderately broad apical bands on tergites 2-4 and the entire tergites 5-7 black; nearly apical half of femora III and apex of tibiae III black; flagellum without annulus; length 11-12 mm.

Flagellum.—Bristleshaped, very slender, extremely attenuated and acutely pointed at apex, not at all widened beyond middle, the first segment fully three times as long as wide. Ferruginous, including scape; without annulus; infuscated at apex.

Head.—Temple profile moderately, cheek profile distinctly narrowed, the former with somewhat curved, the latter with almost straight outline; malar space distinctly longer than width of base of mandible; middle of face and clypeus somewhat convex; mandibles fairly stout with strong and short teeth. Ferruginous; supraantennal cavities and ocellar region black.

Thorax.—Mesoscutum slightly convex, distinctly and fairly densely punctured; notauli basally indicated; scutellum somewhat raised above postscutellum, dorsally slightly convex; carination complete; area superomedia scarcely longer than wide, hexagonal, receiving the costulae approximately in the middle and slightly narrowed from the point of their insertion toward base and apex. Ferruginous; the following are black: prosternum, prepectus, middle of propleura, mesosolcus, apical margin of mesopleura, band on mesopleura below subalarum, propodeal and scutellar sutures.

Legs.—Slender; approximately apical half of femora III and apex of tibiae III broadly black; tarsi III infuscated.

Abdomen.—Elongate, slender, tapering toward apex and apically slightly compressed; ovipositor distinctly projecting; petiolus not as gradually widening into postpetiolus as in *luperinae*, its median field clearly defined and finely, longitudinally striate; gastrocoeli subobsolete; second and third tergites without distinct puncturation, very finely alutaceous and subopaque; the following tergites are black: moderately broad apical bands on tergites 2-4, tergites 5-7 entirely, in the specimen from Saskatchewan also base and ventral side of petiolus.

Remarks

Two males in C.H.T. from Rhode Island and Massachusetts correspond chromatically so well with *indemnis* females, that I would not hesitate to associate both, if these males had come from the west instead from New England where the occurrence of *indemnis* can not be supposed unless a female is collected there.

8. *Ectopimorpha scibilis* (Cresson)

Ichneumon scibilis Cresson, 1877, Amer. Ent. Soc. Trans., 6:183, ♂.

Types

Holotype.— ♂, Illinois. A.N.S.

Distribution

Illinois.

Preamble

The association of this male, until now known only by the type specimen, remains unknown and its generic status seems to be somewhat uncertain. The chromatic characters of the type correspond well with *Exephanes subfulvus* (Cresson), but the densely punctured sculpture of the second tergite makes the association rather unlikely.

Male

Pale ferruginous, scutellum yellow; apical margins narrowly of tergites 2-4 and apex of femora III and of tibiae III black; coxae and trochanters I and II yellow; prosternum, prepectus, mesosolcus and thoracic sutures black; length 11 mm.

Flagellum.—(Only basal half of flagella left.) Very slender, first segment nearly 4 times as long as wide; I did not find tyloides. Ferruginous, infuscated at apex according to original description; scape ventrally yellow.

Head.—Malar space somewhat shorter than width of base of mandible. Ferruginous; face and clypeus yellow.

Thorax.—Areolation of propodeum complete and distinct; area superomedia large, confluent with area basalis, smooth, almost parallel-sided, with the costulae somewhat beyond middle and slightly widened at the insertion of the latter. Ferruginous; scutellum and tegulae yellow; prosternum, prepectus, mesosulcus and thoracic sutures black.

Legs.—Slender. Ferruginous; coxae and trochanters I and II yellow; apices of femora III and the tibiae III black.

Abdomen.—Median field of postpetiolus indicated, very finely and irregularly, longitudinally striate; gastrocoeli subobsolete, weakly indicated as a narrow, longitudinal, lateral impression on the base of the second tergite; tergites 2-4 very finely but fairly densely punctured, scarcely shiny. Ferruginous; apical margins of second to fourth tergites blackish.

9. *Ectopimorpha utahensis*, new species

Types

Holotype.—♂, Utah, 10 mi. north Orderville, 5500 feet, 14.VIII.1948. C.N.C. No. 7259.

Paratypes.—3 ♂ ♂ from type locality and date. C.N.C.

Distribution

Utah.

Preamble

A characteristic feature of this male is the shape of the second tergite, which narrows gradually from its apex toward base, where it is only about one third as wide as at the apex; also the black color of the thorax and the broadly rounded temple profile are distinguishing features.

Male

Head and thorax black; scutellum, face, clypeus, frontal orbits narrowly and vertical orbits broadly, yellow; abdomen ferruginous, base of fourth tergite narrowly, of fifth and sixth tergites broadly, black; legs ferruginous, coxae predominantly, femora III almost entirely, sometimes also femora II partially and the apex of tibiae III black; flagellum dorsally black; length 11-12 mm.

Flagellum.—With 39 or 40 segments and with narrow, bacilliform tyloides on segments 7-15. Dorsally black, ventrally brownish except at base; scape black, ventrally yellow.

Head.—Temple profile scarcely narrowed, broadly curved, cheek profile distinctly narrowed with nearly straight outline; malar space distinctly shorter than width of base of mandible. Black; the following are yellow: clypeus and face, narrow frontal and broad vertical orbits, sometimes mandibles except teeth.

Thorax.—Mesoscutum somewhat narrowed, longer than medially wide, fairly convex and fairly densely punctured, shiny; notauli basally indicated; scutellum distinctly raised above postscutellum, dorsally moderately convex; area superomedia receiving costulae near to apex, somewhat narrowed toward base, usually somewhat longer than apically wide. Black; the following are yellow: apex of pronotal ridge, subalarum more or less extensively, scutellum, sometimes collare.

Legs.—Moderately slender; femora comparatively stouter than in *luperinae* Cushman. Ferruginous; the following are black: coxae I and II basally or predominantly, coxae III entirely, trochanters III, sometimes also trochanters I and II, femora III entirely (except narrowly at base on interior side), sometimes femora II partially, apex of tibiae III.

Abdomen.—Narrow, tapering toward base; postpetiolus narrow, its median field well defined, rather weakly and fairly irregularly, longitudinally striate; second tergite long, strongly tapering toward base, apically about 3 times as wide as at the base; gastrocoeli indicated as narrow, longitudinal, lateral impressions; tergites finely and more or less densely punctured, shiny. Ferruginous; the following are black: petiolus ventrally, sometimes postpetiolus apically, rarely entire first segment, sometimes base of third tergite narrowly in the middle, always base of fourth tergite narrowly and bases of fifth and sixth broadly, sometimes sixth tergite entirely.

10. *Ectopimorpha boops*, new species

Types

Holotype.— ♂, California, Crescent City, 2.VIII.1940, H. and M. Townes. C.H.T.

Paratypes.—8 ♂ ♂, same locality and data. C.H.T.

Distribution

California.

Preamble

Most closely related to *utahensis*, new species, and agreeing with the latter chromatically and in every other regard, except for the structure of head. I suspect that both forms replace each other geographically; a structural difference of the head as described below is, however, as a rule regarded as an indication of a specific rather than merely of a subspecific differentiation. The case is analogous to that of the two *Ichneumon* species *chasmodops* Heinrich and *pycnocephalus* Heinrich.

Male

Head and thorax black, scutellum, face, clypeus, frontal orbits narrowly and vertical orbits broadly, yellow; abdomen ferruginous, base of fourth tergite usually narrowly, of fifth and sixth tergites broadly, black; legs ferruginous, coxae predominantly, femora III almost entirely, sometimes also femora II partially and the apex of tibiae III black; length 10-13 mm.

Flagellum.—With 35-42 segments, with narrow, bacilliform tyloides on segments 7-14. Dorsally black, ventrally brownish except at base; scape black, ventrally yellow.

Head.—Temple profile widened, with strongly curved bulging outline; cheeks distinctly inflated, in vertical front view outline of both cheeks just visible behind the middle of eyes (in *utahensis* hidden behind eyes).

Thorax.—As in *utahensis.* In some specimens mesoscutum with two ferruginous, longitudinal stripes.

Legs.—As in *utahensis;* femora III, however, in all specimens with ferruginous, dorsal stripe from base to apex; only in one specimen femora II and also femora I partially black.

Abdomen.—As in *utahensis,* except one specimen with obsolete, black bands on the fourth and fifth tergites.

23. Genus *Pseudoamblyteles* Heinrich

Figs. 33, 42

Pseudoamblyteles Heinrich, 1926, Dt. Entom. Zeitschr. (Heft 3):255.

Type-species.—Amblyteles homocerus Wesmael. Monobasic.
Ctenamblyteles Heinrich, 1928, Dt. Entom. Zeitschr. (Heft 2):141[4]

Agrees with *Patrocloides* Heinrich in the structure of gastrocoeli, which are large, deep and wide, with extremely narrowed interval and with large, wide, oblique thyridia (Fig. 42). Shares with the mentioned genus also the amblypygous apex of abdomen of females. Differs from *Patrocloides* in both sexes in the claws which are strongly and densely pectinate the whole length from the base to the beginning of the apical curve (Fig. 33). In the latter character *Pseudoamblyteles* agrees with *Patroclus* Cresson from which it is distinguished: (1) by the presence of short but distinct apophyses on the propodeum in both sexes; (2) by the presence of a long row of pronounced, longish-oval tyloides on the flagellum of the male; (3) by the shape of the abdomen of the female which is more elongate, the last tergites not being abbreviated, the seventh distinctly surpassing the hypopygium. Legs in both sexes of the type of the genus much stouter than in *Patroclus.*

Color.—Black; femora and tibiae rufous.

Distribution.—Holarctic, including Mediterranean Africa.

Biology.—The data of large series which I collected in the European Alps in 1947 indicate that females hibernate. Only females were collected during May and the first half of June. Already about the end of June the new generation with males and females began to appear.

Pseudoamblyteles homocerus (Wesmael)

Figs. 33, 42

Amblyteles homocerus Wesmael, 1857, Bull. Acad. Sci. Belgique, p. 121, ♀ ♂.
Pseudoamblyteles homocerus Heinrich, 1926, Dt. Entom. Zeitschr. (Heft 3):255, ♀ ♂.
Ctenamblyteles homocerus Heinrich, 1949, Mitt. Muench. Ent. Ges. 35-39, Heft 1, p. 6, ♀ ♂.
Ctenamblyteles homocerus Heinrich, 1956, Can. Entom., 88:651, ♀ ♂.

Types

Holotype.—?, France. Musée Royal d'Histoire Naturelle de Belgique, Bruxelles.

Host

In Europe reared from *Plusia variabilis* Piller = (*Plusia illustris* Fabricius).

[4]*Ctenamblyteles* was introduced as a new name for *Pseudoamblyteles* Heinrich, the latter being regarded as homonymous with *Pseudamblyteles* Ashmead. Present studies of the rulings of the International Commission of Zoological Nomenclature have revealed, however, that the two names, although differing by only one letter, do not fall into the category in which they would be considered as homonyms. Therefore *Pseudoamblyteles* is the valid name for this genus.

Distribution

Holarctic, including the Mediterranean part of North Africa (Algeria and Tunisia). In North America Transcontinental in Hudsonian and Canadian Zones. Records: Northwest Territories (Salmita Mines, Coppermine); British Columbia (Revelstoke Mt., 600 ft., Ft. Nelson); Wyoming, Yellowstone Lake and River, 7740 ft.; Ontario (MacDiarmid); Quebec, Rupert House; Yukon, Rampart House; Alaska, Anchorage. (C.N.C.); Colorado. (C.H.T.).

Female

Uniformly black, including scutellum and flagellum; femora, tibiae and tarsi rufous; tarsi III predominantly black; wings clear or slightly, in the specimens from Colorado fairly strongly, infuscated; length 12-15 mm.

Flagellum.—Bristleshaped, slender, moderately long, considerably attenuated, with acute apex, ventrally not distinctly flattened and not at all widened beyond middle, with 34-38 segments, the first fully three times as long as wide, about the fifteenth or sixteenth square. Uniformly black, including scape.

Head.—Temple profile moderately, cheek profile distinctly narrowed, the former with slightly curved, the latter with straight outline; malar space a little longer than width of base of mandible; whole surface including cheeks rather strongly and densely punctured and having the median field of face scarcely convex. Uniformly black.

Thorax.—Mesoscutum convex, strongly and rather densely punctured; notauli basally indicated; scutellum considerably raised above postscutellum, punctured as the mesoscutum, usually laterally weakly carinate at the very base; area superomedia usually about as wide as long and a little narrowed at anterior end; costulae obsolete or subobsolete; areae dentiparae ending in a short, toothlike projection. Uniformly black.

Legs.—Moderately stout; coxae III densely punctured, without scopa; claws pectinate for their whole length (Fig. 33). Rufous; coxae, trochanters, trochantelli and tarsi III predominantly black, usually also the apical border of tibiae III infuscated; apex of tarsi III usually brownish.

Abdomen.—Median field of postpetiolus longitudinally striate; interval of gastrocoeli with short, longitudinal striae too; second tergite fairly strongly and densely, the third more finely punctured; plica includes the third sternite. Uniformly black.

Male

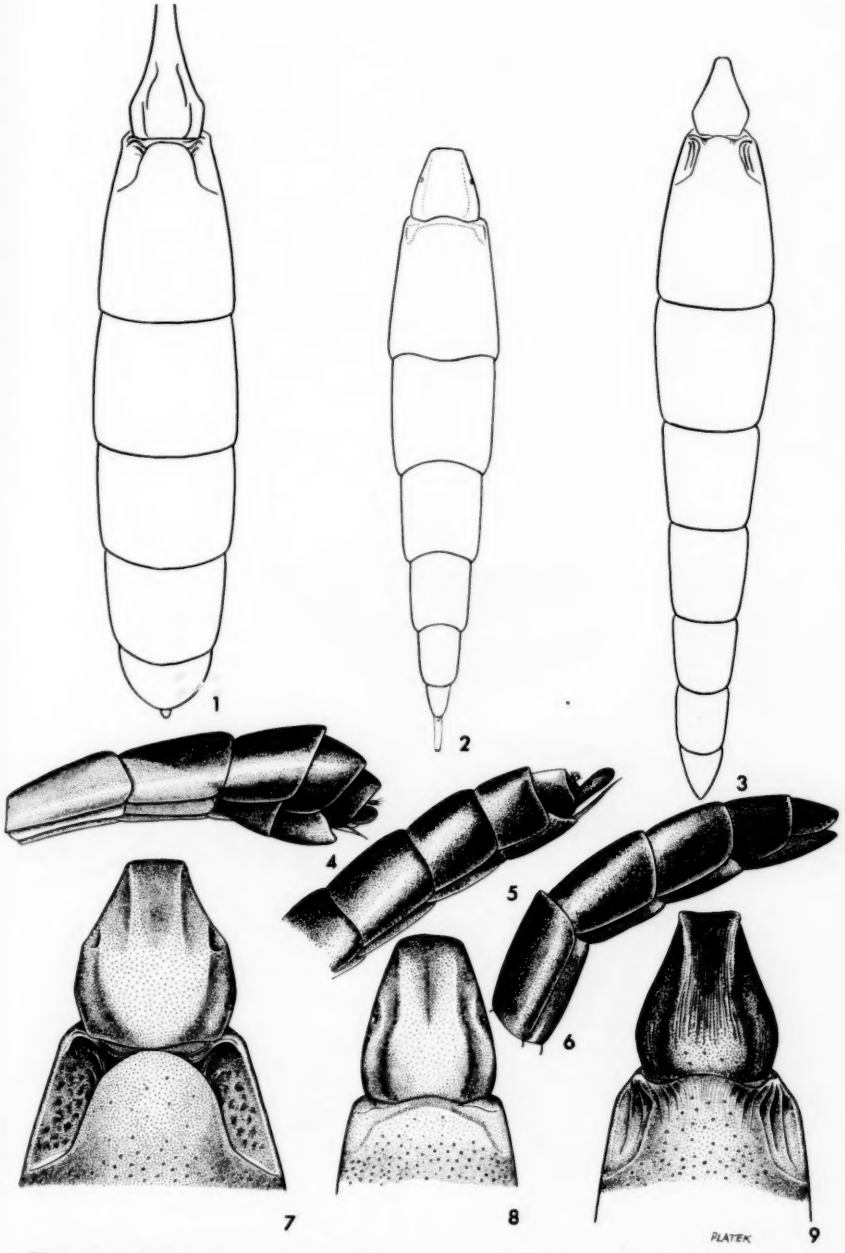
Uniformly black, including scutellum and flagellum; femora, tibiae and tarsi rufous; tarsi III, rarely also tarsi II predominantly or entirely black; wings clear or somewhat infuscated; length 14-18 mm.

Flagellum.—With oval tyloides on segments 6 or 7 to 18 or 19, the longest by far not reaching bases or apices of segments.

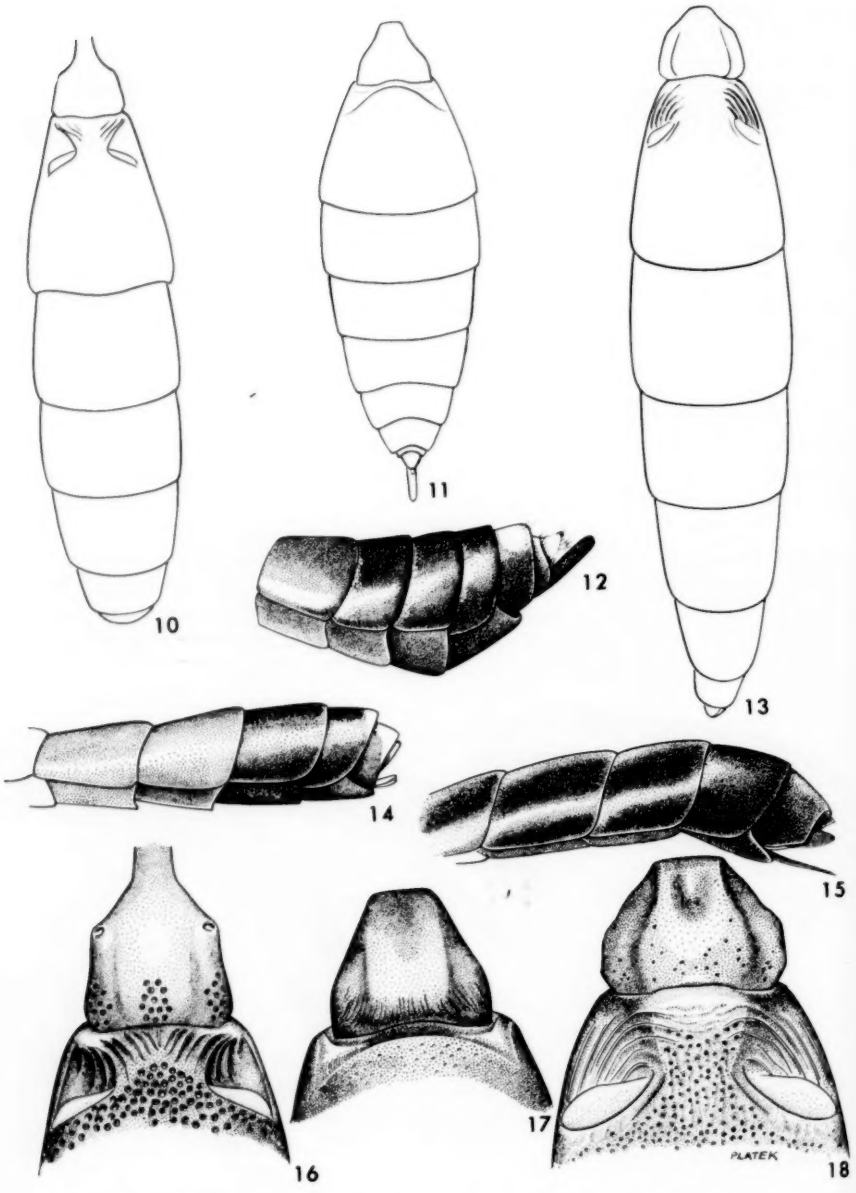
Remarks

I compared North American series of this species with broad series of European (alpine) origin and found not even slight subspecific differences.

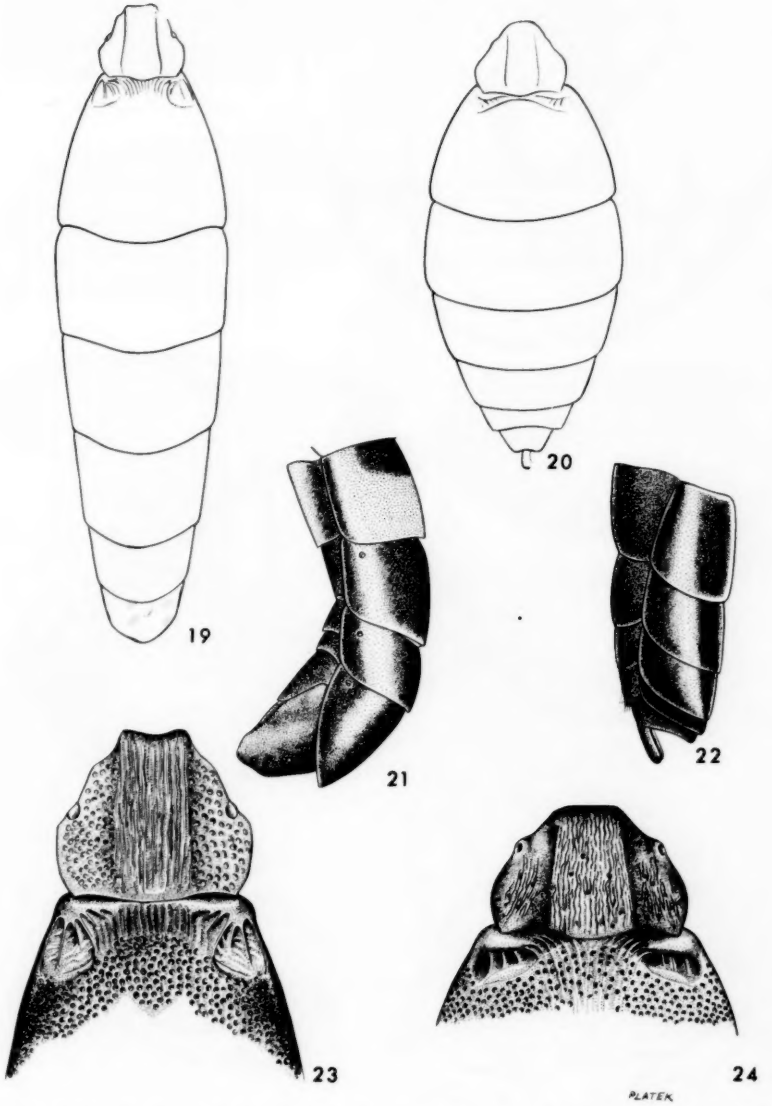
In the Palaearctis the populations from Mediteranean, alpine and middle-European localities do not seem to be entirely homogenous. How far such differences can be regarded as subspecific needs to be investigated.



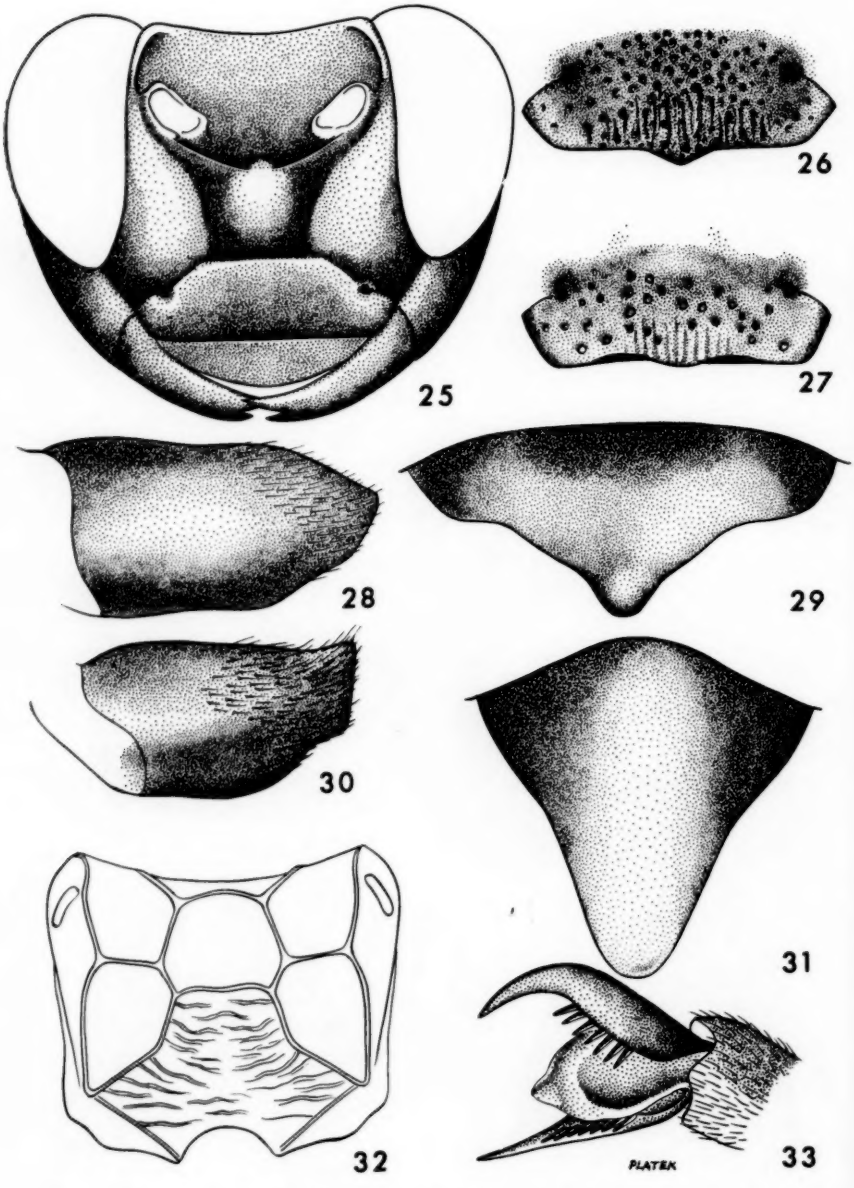
Figs. 1-9. Outlines of abdomens in dorsal view, apices of abdomens in lateral view, and postpetioli with gastrocoeli, all of females. 1, 4, 7, *Neamblymorpha milva* (Cresson); 2, 5, 8, *Ectopimorpha wilsoni* (Cresson); 3, 6, 9, *Limerodops belangeri* (Cresson).



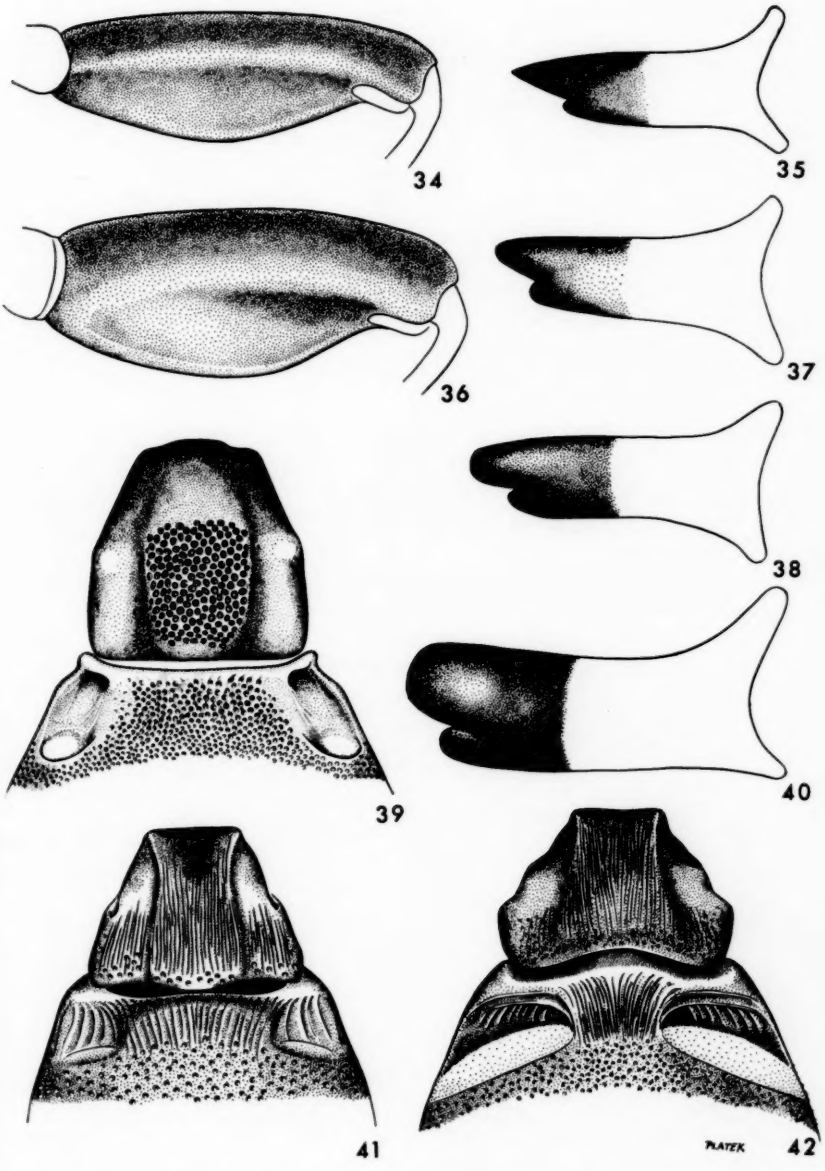
Figs. 10-18. Outlines of abdomens in dorsal view, apices of abdomens in lateral view, and postpetioli with gastrocoeli, all of females. 10, 14, 16, *Tricholabus nortoni* (Cresson); 11, 12, 17, *Exephanes terminalis* (Provancher); 13, 15, 18, *Anisopygus americanus* n. sp.



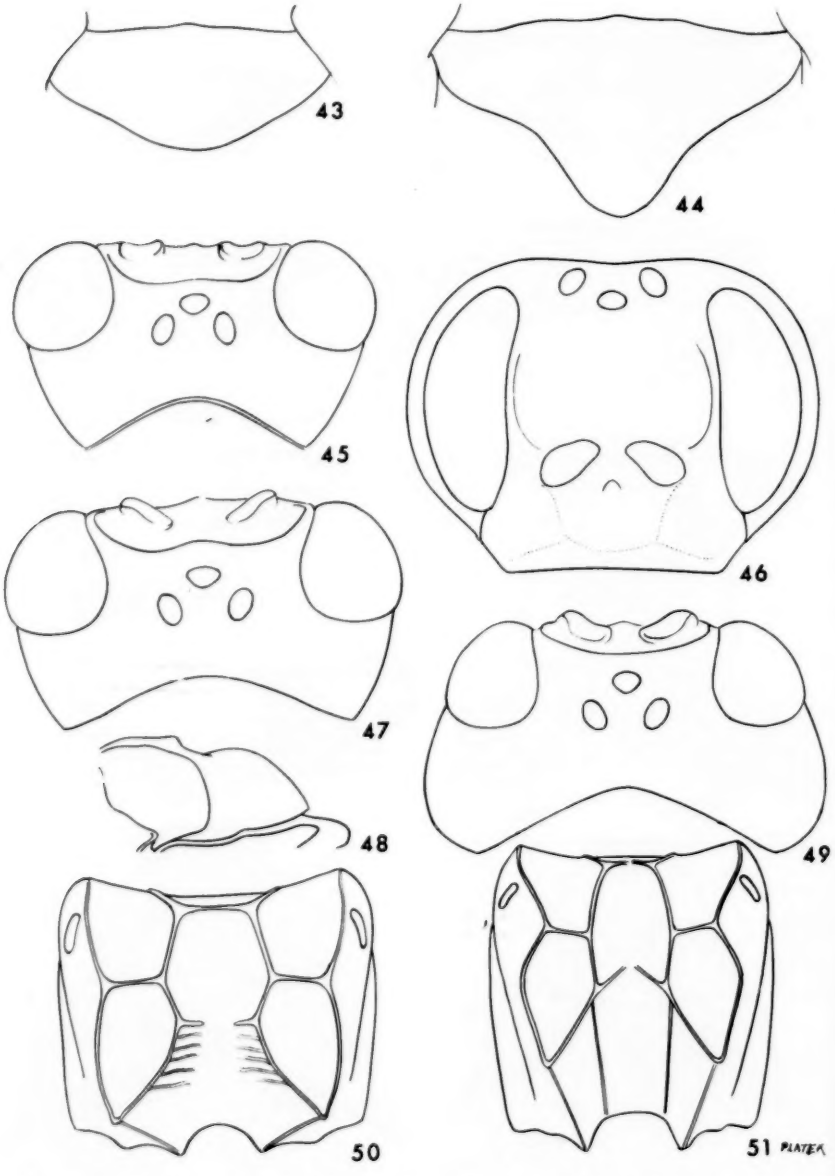
Figs. 19-24. Outlines of abdomens in dorsal view, apices of abdomens in lateral view, and postpetioli with gastrocoeli. 19, 21, 23, *Eutanyacra vilissima* n. sp., ♂; 20, 22, 24, *Eutanyacra solitaria* n. sp., ♀.



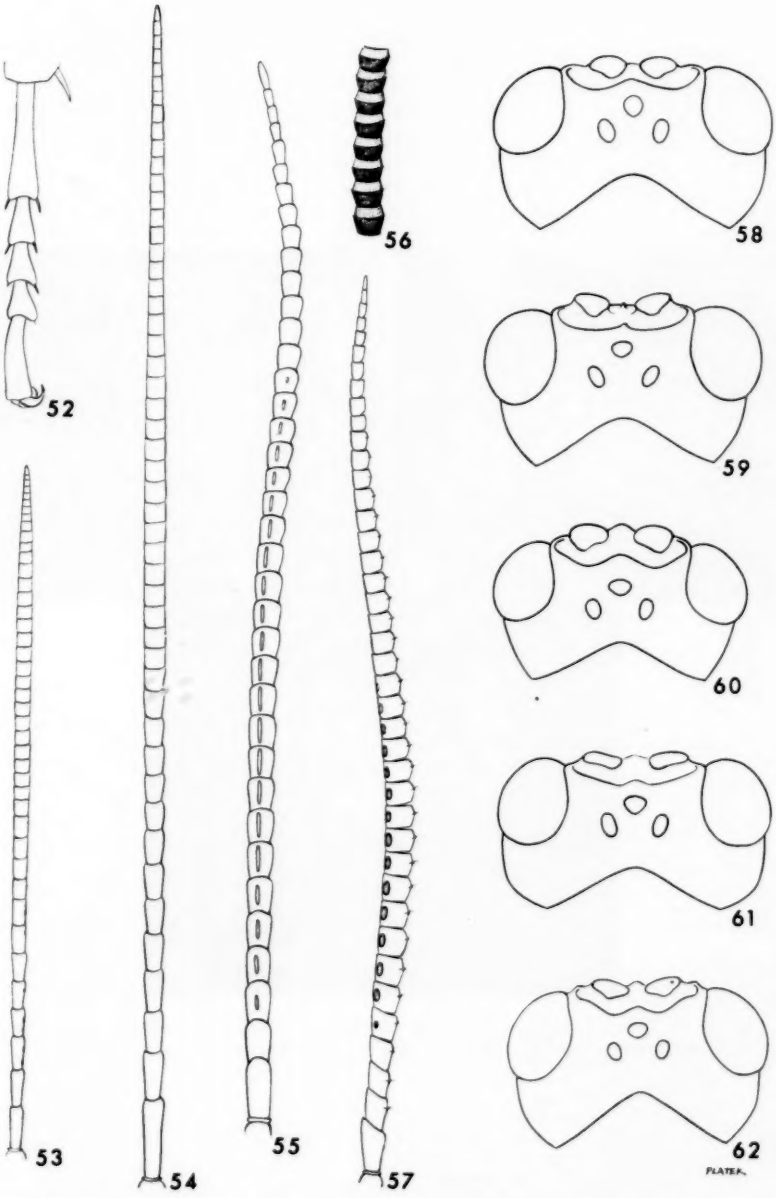
Figs. 25-33. 25, head in front view of *Eupalamus andersoni* n. sp., ♀. Figs. 26-27. Clypei. 26, *Chasmias scelestus* (Cresson), ♂; 27, same species, ♀. Figs. 28, 30. Claspers. 28, *Limerodops belangeri* (Cresson); 30, *Pseudamblyteles ormenus* (Cresson). Figs. 29, 31. Hypopygia of males. 29, *Tricholabus nortoni* (Cresson); 31, *Eutanyacra vilissima* n. sp. Fig. 32, carination of propodeum of *Exephanes terminalis* (Provancher), ♀. Fig. 33, pectination of claws of *Pseudoamblyteles homocerus* (Wesmael), ♀.



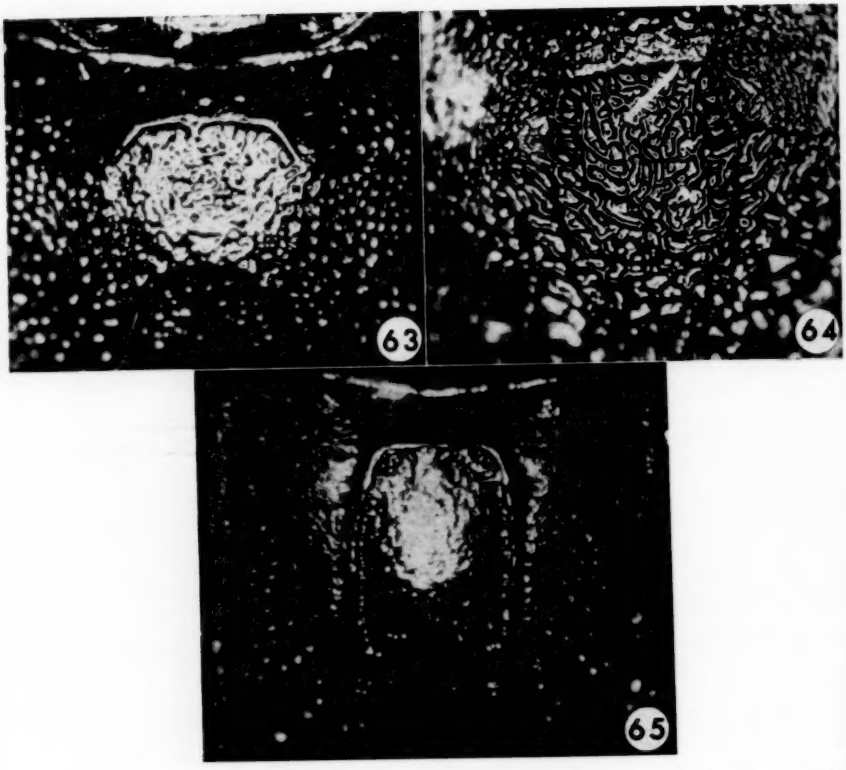
Figs. 34-42. All of females. Figs. 34, 36. Femora II. 34, *Eutanyacra solitaria* n. sp.; 36, *Eutanyacra munifica* (Cresson). Figs. 35, 37-38, 40. Mandibles. 35, *Pseudamblyteles flebilis* (Cresson); 37, *Pseudamblyteles distinctipes* n. sp.; 38, *Eutanyacra solitaria* n. sp.; 40, *Eutanyacra munifica* (Cresson). Figs. 39, 41-42. Postpetioli and gastrocoeli. 39, *Eupalamus andersoni* n. sp.; 41, *Pseudamblyteles flebilis* (Cresson); 42, *Pseudoamblyteles homocerus* (Wesmael).



Figs. 43-51. Figs. 43-44. Hypopygia of males. 43, *Limerodops belangeri* (Cresson); 44, *Limerodops mariannae* n. sp. Figs. 45, 47, 49. Temple profiles in dorsal view of females. 45, *Limerodops belangeri* (Cresson); 47, *Limerodops mariannae* n. sp.; 49, *Eutanyacra pycnopus* n. sp. Fig. 46, outline of head in front view of *Eutanyacra pycnopus* n. sp., ♀. Fig. 48, scutellum in lateral view of *Neamblymorpha milva* (Cresson), ♀. Figs. 50-51. Carinations of propodea. 50, *Ectopimorpha wilsoni* (Cresson), ♀; 51, *Tricholabus nortoni* (Cresson), ♀.



Figs. 52-62. Fig. 52, tarsi II of *Eupalamus andersoni* n. sp., ♀. Figs. 53-55, 57. Flagella. 53, *Limerodops belangeri* (Cresson), ♀; 54, *Neamblymorpha milva* (Cresson), ♀; 55, *Eutanyacra vilissima* n. sp., ♂; 57, *Ctenichneumon excultus* (Cresson), ♂. Fig. 56, transverse ridges on flagellar segments of *Ctenichneumon excultus* (Cresson), ♂. Figs. 58-62. Temple profiles in dorsal view. 58, *Tricholabus citatus* (Provancher), ♀; 59, *T. nortoni* (Cresson), ♀; 60, same species, ♂; 61, *T. adventicus* Hopper, ♀; 62, same species, ♂.



Figs. 63-65. Areae superomediae, all of females. 63, *Anisopygus americanus* n. sp.; 64, *Eupalamus melacneme* n. sp.; 65, *Chasmias scelestus* (Cresson).

INDEX

(Index is to valid nearctic genera, subgenera, species and subspecies in the portion of the tribe **Ichneumonini** appearing in Part IV.)

	Page
adventicus Hop.	393
americanus n. sp.	379
amoenipes n. sp.	413
andersoni n. sp.	385
Anisopygus Kriech.	376
belangeri Cress.	382
bizonatus Cress.	406
boops n. sp.	494
caeruleops n. sp.	461
californica n. sp.	490
californicus n. sp.	480
carbo n. sp.	419
Chasmias Ashm.	373
chillcotti Heinr.	431
citatus Prov.	391
columbiana n. ssp.	428
columbianus n. sp.	457
comptus Say	403
consignata Cress.	430
Ctenichneumon Thoms.	450
distinctipes n. sp.	409
Ectopimorpha Vier.	482
effigialis n. sp.	407
Eupalamus Wesm.	385
Entanyacra Cameron	422
excultus Cress.	454
Exephanes Wesm.	475
flebilis Cress.	411
foxleei, n. sp.	396
gracilior n. sp.	470
heteropus n. sp.	454
hiemans n. sp.	436
hiulca Cress.	486
hiulcops n. sp.	486
holomelas n. sp.	460
homocerus Wesm.	495
immaculatus n. ssp.	479
improvisa Cress.	427
improvisa Cress., ssp.	428
indemnis Cress.	491
interstinctus Heinr.	410
Limerodops Heinr.	380
limerodops n. sp.	487
luperinae Cush.	488
mariannae n. sp.	383
melacneme n. sp.	386
micramoenus n. sp.	420
milva Cress.	376
minor n. sp.	458
mitchelli n. sp.	395
miraculosa n. sp.	434
munifica Cress.	444
Neamblymorpha Heinr.	375
nearcticus, n. ssp.	378
nigrotergops n. sp.	417
nortonii Cress.	390
ormenus Cress.	414
pax Dalla Torre	397
perannulata Hopper	429
populorum n. sp.	418
provancheri Cush.	404
Pseudamblyteles Ashm.	397
Pseudoamblyteles Heinr.	495
pseudonymus Wesm.	377
pseudonymus Wesm., ssp.	378
punctiscuta n. sp.	463
pycnopus n. sp.	435
robustus Cress.	401
rubricosa n. ssp.	441
rufibasis n. sp.	469
ruidosensis Coquerell	474
saguenayensis Prov.	446
scelestus Cress.	374
scibilis Cress.	492
semicaeruleus Cress.	461
solitaria n. sp.	442
subfulvus Cress.	480
succincta Brullé	433
suturalis Say	437
syphax Cress.	471
terminalis Prov.	477
terminalis Prov., ssp.	479
townesi n. sp.	467
Tricholabus Thoms.	387
trivittata n. sp.	448
ultus Cress.	464
utahensis n. sp.	493
valdenigra Heinr.	426
validiceps n. sp.	443
vilissima n. sp.	439
vilissima n. ssp.	440
walleyi n. sp.	416
wilsoni Cress.	484